

MARINE REVIEW.

VOL. XVII.

CLEVELAND, O., MARCH 31, 1898

No. 13.

1898 Hull Insurance.

Insurance on several lake fleets has been placed within the past few days, the initiative being taken again this year by the McCurdy syndicate of Chicago and Johnson & Higgins of New York. It is understood that the British & Foreign company, which is the largest of the big English corporations, is now taking part in the business of the Chicago syndicate. The acquisition of this company, according to a statement made to a Cleveland owner, increases the total assets of companies represented by the syndicate to more than thirty-three millions.

When the several general agents of Buffalo, Chicago and Milwaukee met in Buffalo about the 16th inst. to talk over hull insurance for the coming season, they adopted a resolution that was not made public on the lakes, although a copy of it was immediately cabled to London. The dispatch to London was signed by J. J. Clark, chairman of the meeting, and A. H. McDonald, secretary, and was as follows: "American agents, representing eighteen American and foreign companies writing lake hulls, at a meeting held at Buffalo this day, unanimously passed the following resolution: 'That rates of premium obtaining on lake hulls last year were seriously inadequate to meet the losses and expenses under the conditions of settlement current in the business. Each office represented pledges itself not to write hull business this year except at a very material advance over last season's rates, and with provision for direct representation of companies in the ascertainment and settlement of losses.'

Copies of the Inland Lloyd's Register for 1898, prepared under the direction of Capt. A. B. Drake at Buffalo, are being distributed among insurance agents, and are, of course, being examined with a great deal of interest by vessel owners. Unlike the register of last year, the 1898 book aims to place values for insurance purposes on all vessels. The figures are materially reduced in nearly all cases, and it is the general opinion among vessel men that the valuations, as well as the ratings, are quite satisfactory. There is always more or less objection in individual cases, but this year little has been said of inconsistencies found by comparing vessels that are known to be of about equal age, equal value, etc. In view of the short time allowed for the preparation of the register, Capt. Drake is to be congratulated on the work, especially as it is understood that the surveyors managed to go over every vessel within reach.

Lake Freights.

Two of the largest iron ore firms in Cleveland have been offering Escanaba ore for several days past at 45 cents for the full season. They had not succeeded, up to Thursday, in getting vessels to accept their propositions, but they said they were quite certain of success and would "stand pat" on the 45-cent figure. A little more ore was placed during the week at 60 cents from the head of the lakes for the full season, but most of the individual vessel owners have decided to depend upon wild rates rather than accept the figures at which contracts are offered. James Davidson has written to different vessel men around the lakes declaring that he would not accept 70 cents on season ore from the head of Lake Superior in view of the outlook in iron industry. This is an extreme view of the situation, but it is certain, nevertheless, that there never was a time when the iron and steel plants of the United States were as fully employed, or when order books were as well filled, as they are at present.

Eight or ten vessels have been chartered at Buffalo to load hard coal for the head of Lake Superior at 20 cents. At Ohio ports vessels are still loading soft coal at 25 cents to Lake Superior and 30 cents to Lake Michigan, but shippers talk of paying only 20 cents to Lake Superior when the grain fleet begins to arrive down from Chicago. Soft coal shippers are now generally of the opinion that new mining scales will be fully accepted by the operators of Ohio and Pennsylvania, and there will be no strike of miners this spring.

The clause in the naval appropriation bill, now before congress, relating to four new dry docks, provides that \$200,000 is to be allowed in each case for the beginning of work on the docks; each is to be not less than 700 feet long and sufficient to meet probable future requirements of the largest vessels, and to be located at Portsmouth, N. H.; Boston, Mass.; League Island, Pa., and Mare Island, Cal., the total cost when completed not to exceed \$850,000 each. The Algiers, La., dry dock is to be of the double-sided, steel floating type, known as the combined floating and graving self-docking dock, capable of lifting a vessel of 15,000 tons displacement and 27 feet draft of water. The bill also directs the appointment of a board of naval officers to determine the desirability of locating and constructing a dry dock in the harbor of Galveston, Texas, and to report to congress at the next session.

James Lee, naval constructor in the United States revenue cutter service, is in Cleveland, planning for the transfer of the new revenue cutters Gresham, Algonquin and Onondaga, from the lakes to the Atlantic seaboard, to be used for naval service in event of war with Spain. It will be two or three weeks before the St. Lawrence canals are open to navigation, and in any event 30 or 35 feet must be taken off the sterns of the cutters in order to move them through the locks, so that the Cuban difficulties may be ended while changes in the vessels are being made.

The Carnegie-Oliver mining interest has about concluded arrangements for the lease of another mine, the Zenith, on the Vermilion range. This mine produced about 40,000 tons last year. The output will undoubtedly be largely increased if control of the mine is secured by the big Pittsburgh interest.

Ship Yard Matters.

Lake ship builders have been figuring, during the past week or ten days, on as many as seven or eight prospective orders for new ships. Contracts have been closed in one, and possibly two, cases, but particulars are withheld for the present. Nearly all of the builders have submitted prices on a car ferry for Ann Arbor company of Toledo for Lake Michigan service, and on a modern fire boat for the City of Chicago.

The steel barge building at Chicago for the Minnesota Steamship Co. is to be completed Aug. 1. This vessel is to be named Maia. The shell of this vessel will very probably be put together with machine rivets, as a tool for that purpose is now nearing completion at the Chicago yard. The steel barge building for the Minnesota company at West Superior will very probably be out on time—May 1. This vessel is to be named Maida. It is intended to launch her April 16. It has been definitely decided that the steamer building at West Superior will be named Alexander McDougall. She will not be completed until about June 1. The slip into which she is to be launched must be lengthened about 30 feet. One of the two steel tugs building at the works of the Union Dry Dock Co., Buffalo, will be named Charles F. Dunbar. The steel tug for L. P. & J. A. Smith of Cleveland, just completed at the Bell Engine Works, Buffalo, has been named H. D. Goulder.

The steamer Superior City, building at the yard of the Cleveland Ship Building Co. at Lorain for A. B. Wolvin of Duluth will be launched Saturday, April 9. The new boat will be commanded by Capt. Ralph Lyons. The schooner building at the yard of the Globe Iron Works Co. for Capt. Thomas Wilson will be launched the same day.

A new tug was launched at Manitowoc, a few days ago, for Endress Bros. of Sault Ste. Marie and named C. W. Endress. Her keel length is 86 feet, beam 20 feet 6 inches and depth of hold 8 feet 6 inches; net tonnage, 49.71.

The tug William M. Gee, building for David Baird of Camden, N. J., at the yard of Hingston & Sons, Buffalo, was launched Saturday.

Grain-Shoveling Question Compromised.

Secretary Charles H. Keep of the Lake Carriers' Association will send out from Buffalo tomorrow (April 1) a circular announcing a settlement of the grain shoveling problem, made by the executive officers of the association. The charge per thousand bushels for shoveling grain at Buffalo during the coming season will be \$3.10, which is 15 cents more than the figure agreed upon at the last annual meeting of the Lake Carriers' Association in Detroit, but 25 cents less than was paid last year. It is agreed in the compromise that the elevators are to be paid \$1.20 for the steam shovels; the men are to be paid \$1.85, the same as last year, and the contractor, W. J. Conners, is to receive but 5 cents. James Kennedy, who had the contract last year, is to have an interest in the contract with Mr. Conners. The details of difficulties encountered in settling this question would make up a long story. It is probably sufficient to say, for the present, that the course of Mr. Conners in the matter was decidedly liberal and honorable, and must be appreciated by the vessel owners. He was willing, up to the last, to carry out to the end the contract made at Detroit, and he did not desire or seek a compromise.

A company will be formed in Cleveland to operate between Cleveland, Toledo and Ogdensburg the steamers Badger State and Empire State, recently purchased by W. A. Collier and C. E. Grover from the Detroit Dry Dock Co. for \$15,000. About \$10,000 will be spent at once in alterations and repairs on the vessels, and everything is fixed so that in ten trips during the coming summer they are to return the full investment from a great passenger and freight patronage that awaits them. But, speaking seriously, it would seem that there should be business enough between the ports named to keep these vessels engaged at a profit, in view of their low cost to the new owners. They were the property of the Western Transit Co. until last fall, when the Detroit Dry Dock Co. took them in a trade in connection with the contract for a steel steamer now building at Wyandotte for the Western line.

Commercial bodies of New York state have succeeded in preventing the passage of a resolution by the state legislature permitting the sale or lease of the Erie canal to the United States, but now they are struggling with another difficulty, as it is quite certain that Gov. Black will veto any measure providing for additional expenditures on the canal in advance of an investigation regarding the appropriation of \$9,000,000 which was so hurriedly disposed of. The investigating commission appointed by the governor has appointed as its expert engineer Edward P. North of New York, who is vice-president of the American Society of Civil Engineers.

A Buffalo dispatch stating that W. H. Johnson had been appointed "agent of the Anchor line to succeed J. C. & E. T. Evans, resigned," is entirely in error. The circular referring to this matter is signed by E. T. Evans, western agent of the Erie & Western Transportation Co., and it is strange, therefore, that such an error should occur. Mr. Johnson's appointment is simply in the line of convenience in office affairs.

Full 10,500,000 bushels of grain (nearly 8,500,000 bushels of it corn) is now afloat in Chicago, and it will begin moving down the lakes as soon as an effort is made to pass the Straits. At Milwaukee there is 1,825,000 bushels afloat. This will also be moving towards Buffalo in a few days.

Government vs. Private Docks.

Washington, D. C., March 30.—When appropriations for four new dry docks, contained in the naval appropriation bill, were under consideration in the house of representatives, a few days ago, official announcement was made to that body of the intention of the Newport News Ship Building & Dry Dock Co. to complete, within a year, at its big ship building plant at Newport News, one of the largest dry docks in the world. It must be admitted that concerns like the Newport News company have reason to complain of the hasty action of the government at this time regarding new docks. This company has certainly shown great enterprise in undertaking the construction of another immense dock. Its plans, which are necessarily dependent to some extent on patronage from the navy, are barely completed when the government steps in and, under the pressure of a war scare, proposes to build dry docks on an immense scale. There is considerable feeling in both houses of congress against the government going to extremes in this matter of new docks, and it would not be surprising to find that the appropriations for dock purposes will be cut down materially before the naval bill is finally acted upon. Such will undoubtedly be the case if the preparations for war now going on in Washington are checked within the next week or ten days by a continuance of the firm policy of the administration shown in connection with the report of the Maine court of inquiry. The action of the Newport News Co. in going ahead with its dock project will also tend to restrict the naval dock plans, especially at places like Algiers, near New Orleans, and at Galveston, where surveys for a new dock are proposed. There are no navy yards at either of these places, and this is one of the principal reasons for objection to new docks, as the building of docks must necessarily be followed by other equipment for repairing vessels. New naval stations involving large expenditures would follow the construction of these docks. This is the ground for objection taken by Mr. Cannon of the appropriation committee, who read a letter from the Newport News Co. in the house on Saturday giving some interesting particulars of their new dock. In this letter, Mr. L. E. Payson, a Washington attorney representing the Newport News Co., says:

"Details of plans are being perfected so that excavation will be begun in a few days now. The dry dock will be 1,140 feet long, 90 feet wide at bottom, taking a ship of 95 feet beam, with a middle gate, thus taking in two vessels at one time if necessary, and costing approximately \$1,000,000. This dock will accommodate at one time any two of the largest battleships in the world. The depth of water over the sill will be 30 feet. The dock will be completed within one year from this date. Its construction will be pushed with the energy characteristic of this yard. This company has at this time the most modern ship building and ship repairing plant in the world, and will enlarge and improve upon what it has in connection with the new dry dock. As illustrating, work is approaching completion upon a new hoisting crane, with a capacity of 150 tons, to be located below the old dry dock and at a wharf near the proposed dry dock, for utilization with it. The Newport News company recognizes the necessity of such a dry dock within the United States and on the Atlantic coast, that this nation shall not depend upon the courtesy of a foreign nation when dockage of our large cruisers and battleships is necessary for any purpose. For extensive repairs upon cruisers or battleships the advantage of having a very large force of skilled mechanics ready for immediate work is apparent, as is also the ready availability of the immense plant and machinery which this company has and will maintain. Moreover, it is ready and willing to enter into a contract with the government, giving its work immediate preference and treating any contract as one of urgency when desired by the government, working day and night if desired in urgent cases. Undoubtedly very much minor repairing should and will be done at the government yards, but it is submitted to you that such advantages as can be offered by this company in its new dock, shops and yards and appliances cannot be hoped for, as to larger work upon the great ships in our navy, in the national navy-yards."

Opening of Navigation—April Weather.

The Straits of Mackinac are now practically free for the passage of vessels, but there is still considerable speculation as to when vessels may work through the St. Mary's river. During the last forty-two years navigation at the "Soo" has opened before April 20 five times, and on or before the 15th twice, viz.: in 1889 and 1878. The date of opening in 1878, viz.: April 8, is the earliest of record. The winter of 1877-78 was mild and open, and the weather during March and April was exceptionally warm throughout the entire lake region. Vessels passed through the Straits of Mackinac as early as March 14. The first large steamer bound for lower lake ports left Duluth, the head of navigation on Lake Superior, on April 4, and the first arrivals from the east reached that port on the 12th. The time between the earliest and latest opening of navigation at the "Soo" and Lake Superior ports is about thirty days. It has never opened earlier than April 8, nor later than May 12. On the lower lakes the range is somewhat greater.

April weather on the lakes is thus summarized in a chart just issued by the United States weather bureau:

"April is a month of varied possibilities in the way of weather. Not infrequently winter makes its exit during the early days of the month, while summer days in the latter half are not unknown. Two years ago, it will be remembered, snowstorms swept over the lake region during the first part of the month, and the temperature fell to 15° and under in the Superior district, 18° at Chicago, and 22° at Cleveland. Within two weeks afterward shade temperature of 80° and above prevailed over lower Wisconsin and Michigan, but such unusual extremes are not of frequent occurrence. Snowstorms are a possibility during the first half of the month, a fact that should not be lost sight of. April, 1880, was a very disastrous month to lake shipping, on account of northeast gales and snowstorms during the first ten days of the month."

Pervading winds at weather bureau stations on the lakes for April are shown on the chart by arrows that fly with the wind. The highest velocity ever recorded during April and the direction at the time of highest velocity are entered for each station, and there is also a table of highest velocities for April, May, June and the year.

New Lake Michigan Passenger Steamer.

Chicago, March 30.—The new wooden passenger and freight screw steamer Georgia, built for the Goodrich Transportation Co. of Chicago by Messrs. Burger & Burger of Manitowoc, Wis., is nearing completion and will be in commission about May 15. This vessel has been specially designed for winter as well as summer service on Lake Michigan, and will be run on the west shore between Chicago and Green bay ports. Her principal dimensions are: Length over all, 206 feet; length on keel, 192 feet; breadth inside of bulwarks, 34 feet 1 inch; breadth of hull, 29 feet 8 inches; depth, molded, 12 feet 6 inches; depth of hold, 12 feet. She is built of the best Wisconsin oak and has two substantial arches, strongly re-enforced with heavy steel plates on either side, which extend from the fore-foot forward down to near the sternpost aft. The stem and apron piece is over 3 feet thick molded and covered with heavy iron for breaking ice, and the hull is covered with number 12 w. g. iron from below light draft water line to well up under the guards as a thorough protection from ice.

On the cabin deck are forty-six large state rooms, having accommodations for 100 passengers in berths. On the promenade deck in the Texas, immediately abaft the captain's room, are four state rooms made large enough to be used as sitting rooms. These rooms are constructed with double walls and are designed to be occupied separately or en suite, and will be finished in white enameled paint and elegantly upholstered. The dining saloon on the cabin deck forward will accommodate fifty-four persons at one table. A smoking room and wash room forward of the dining saloon may be reached by a hallway from the dining room, and it can also be entered by a stairway from the promenade deck on the starboard side. It is neatly paneled and finished in natural birch with a convenient distribution of plate glass mirrors worked into paneling. In the trunk amidships on cabin deck is a ladies' toilet room and a separate bath room. On the main deck aft is the social hall, or passenger vestibule, which will also be paneled and finished in natural birch polished. Purser's and steward's offices and a package room for the convenience of passengers are located in this part of the vessel. On the fan-tail abaft this vestibule are gentlemen's bath and toilet rooms. There is ample space on the hurricane deck for passengers promenading, although the vessel carries four life-boats and as many life-rafts amidships. Two additional boats are carried at the after rigging and are always suspended in the davits in such a way that they may be lowered at a moment's notice, the boats being all fitted with standard automatic releasing hooks. The galley, with cold storage boxes directly opposite, are on the main deck forward. The vessel will be lighted throughout by electricity, about 1,000 lamps of 16 c. p. each being used. Painting and decorating is by Messrs. Crossman & Sturdy, interior decorators of Chicago, and joiner work by the Manitowoc Building Supply Co. The Georgia is rigged with two pole spars standing about 66 feet above the upper deck, on which are light spanker gaffs for sail when necessary.

The engine is a fore-and-aft compound, with cylinders of 21 and 44 inches diameter and 36 inches stroke. They are of about 900 indicated horse power and were built at the Dry Dock Engine Works, Detroit. The boiler is 14 by 11 feet, built by the Globe Iron Works Co., Cleveland. A steam windlass, furnished by the American Ship Windlass Co., is included among other auxiliary machines. A novel feature of the Georgia is her fire-extinguishing apparatus, which consists of a series of piping with seventy-five sprinklers attached; these sprinklers have a radius of action of about 8 feet and when the pumps are started and the valves opened the entire main deck and the hold, together or separately, can be deluged in a few moments. The system of piping is so arranged overhead that water need not flow except in the place where fire is threatened or already exists. The main cabin and promenade deck and upper works are protected from fire by hydrants with hose attached ready for use, and there are a number of chemical fire extinguishers located all over the vessel in convenient places. The steamer Iowa of the Goodrich line was the first vessel fitted with these sprinklers. Capt. John W. Gillman, superintendent of the fleet, has been at Manitowoc during the winter seeing the work on this vessel carried out according to plans which were prepared at the Goodrich Trans. Co.'s drawing office in Chicago. This is part of a series of alterations and improvements in the Goodrich line, inaugurated by Mr. A. W. Goodrich upon assuming the presidency of the company. Officers of the Georgia are: Captain, Edward Carus; engineer, Joseph Webber; purser, John W. Keith; steward, W. J. Reardon.

John A. Courier, who was associated with Mr. J. M. Forbes in the introduction of Belleville boilers into ships in this country, has had charge of engines and boilers of the passenger steamers North West and North Land during the past winter, and has given the machinery a general overhauling. He says the boilers stood the test of last season very well. Mr. Courier keeps posted on new orders for Belleville boilers throughout the world. He sends us a list of some sixteen ships, mostly vessels of war, that are now being fitted with these boilers. The list includes: For the French navy, a battleship and three cruisers averaging 17,300 horse power, as well as a freight steamer of 1,600 horse power and a mail steamer of 6,000 horse power; for the Russian navy, two cruisers and a gunboat, of 11,000, 9,000 and 1,500 horse power respectively; for the English navy, a cruiser (Vengeance) of 13,500 horse power, two sloops of war, of 1,400 horse power each, and the royal yacht, Victoria and Albert, of 11,000 horse power; for the Japanese navy, a battleship of 17,500 horse power, a cruiser of 15,000 horse power and two cruisers of 14,500 horse power each.

Easter vacation reduced rates for students via Nickel Plate road.—A peerless trio of fast express trains daily. Through sleeping cars between Chicago, Valparaiso, Ft. Wayne, Cleveland, Painesville, Erie, Buffalo, New York and Boston. Unexcelled dining car service. All trains arrive at and depart from the Union passenger station, Van Buren street, Chicago. See agents about reduced rates for students' Easter vacation excursions.

34, April 10.

A brick extension 126 feet long and 60 feet wide is being made at the machine shop of the Hyde Windlass Co., Bath, Me.

Contraction of Insurance Facilities on the Lakes.

Editor Marine Review:—In an article under the above heading in the Marine Review of March 17, a Cleveland vessel owner says:

"As our losses on the lakes are mainly due to bottom damages resulting from stranding in the rivers and from collisions, there is not the demand here for the kind of close inspection in the construction of vessels that exists with ocean-going craft. Regulations governing river navigation and safeguards of various kinds relating to the prevention of collisions are gradually reducing losses from this source. We lost a couple of steamers that were said to have been structurally weak, but the lesson taught by these losses was valuable, and it is certain that no lake captain will ever again be found pushing his ship into a head sea with her stern deep in the water and nearly half her length forward exposed to the pounding effect of the bow striking downward on big waves. No more ships will be lost on account of this method of making fast trips when running light. Water ballast tanks, both forward and aft, will be filled at all times when the weather is such as to endanger a vessel running light. It would seem, therefore, that if we can prove to the underwriters by a summary of previous losses that we are not disposed to load deeper than will be permitted by the stage of the water in connecting channels, we will be accomplishing more than is involved in the question of the structural qualities of one steel vessel as against another. I do not mean to overlook entirely the numerous other causes to which losses are attributed, but I am certainly of the opinion that this question of bottom damages caused by stranding is of the utmost importance."

It is quite evident from this owner's argument that he does not attach much, if any, importance to close inspection or equitable classification, for the reason, as it seems to him, that losses now occurring on the lakes are mainly due to grounding and to bottom damages. "If we can prove to the underwriters that vessel owners are not disposed to load their vessels deeper than channels will permit, that will be all that will be required," he says, "and all other causes will be of minor importance."

The argument against this view of the question, set forth in the same article by an insurance agent, would have been more interesting if it had continued from the standpoint of the classification society, and if more stress had been laid on the need of close inspection, showing more clearly the benefit to the vessel owner that would result from having a complete register containing the true relative values of the lake tonnage. As set forth by the insurance agent, it is true there will come a day of reckoning unless the vessel owner assists and encourages a proper classification and a close inspection applicable to vessels for fresh water navigation. The fact that there has been a loss of a couple of vessels that were known or said to be structurally weak, cannot in any way be construed as being conclusive evidence that all the vessels built since that time (or vessels to be built in the future) are structurally strong and are not in need of close inspection or classification. Neither should it be assumed that losses will be due almost entirely to the causes set forth by this vessel owner. Abundant argument against this claim may be found by examination of the losses of any year or series of years, and it is certain that injury from new causes will occur when least expected. The lesson taught by the loss of a couple of vessels that were said to be structurally weak is of great value, it is true, for it is only by such lessons that the danger of faulty construction is brought home to us. But this lesson cannot be accepted as an absolute safe-guard for the future, as there is no assurance that weak ships in the hands of some vessel masters, and under unexpected conditions of weather, may not still be subjected to rough usage.

In the early period of metal ship building on the lakes, the builders depended upon well-established rules of foreign classification societies for all particulars relating to the scantlings required for a vessel of certain dimensions, as the work was new to them and they had no previous experience to be guided by. Later, when competition increased, the ship builder sought, by deviating from the well-established rules that long experience had shown to be good, to reduce the scantlings to an extent that would enable him to meet competition. This was carried so far that the strength of some vessels became impaired and they were declared structurally weak. Such a condition had its disadvantages for everybody concerned—ship builder, ship owner and underwriter. It could not exist under the application of classification rules and inspection provided by a reliable organization. It must be plain, therefore, that any argument against inspection and classification on the lakes is not well founded, and uniformity in this work will be of special importance. Ship builders will be placed on an equal basis when rules of detail regarding structural parts, such as long experience has shown to be the best for lake practice, are generally adopted. There will be no going back of these rules or their requirements when they are specified in an order for a ship, and the builder will be relieved of considerable responsibility and a great many annoyances that now exist on account of a lack of uniformity in this regard. The vessel owner will have the advantage of inspection that is not confined to design of the hull or material entering into same, but which will include also all of the detail of engines, boilers and their seatings, pumping machinery and piping arrangements, sea chests, discharge and non-return valves, crank shafts, propeller shafts, fittings, bolting, steering gear, and, in fact, all of the numerous parts that are necessary in the completed ship. The vessel owner will also have the advantage of knowing that when such inspection is provided the mark of approval from the classification society will represent the true relative value of his ship and will carry with it all the advantages that may be secured from such classification in the important matter of insurance.

ENGINEER.

Cleveland, March 30, 1898.

Students' Easter vacation rates, by Nickel Plate road.—Low rates everywhere. A peerless trio of fast express trains daily, east and west. All trains arrive at and depart from union passenger station, Van Buren street, Chicago. See agents.

33, April 10.

The American Range Finder Co., a concern that has been engaged for several years in the manufacture of a range finder (instrument to determine distance and location of ships at sea) has made an assignment to Charles B. Van Nostrand of No. 36 Wall street, New York.

Vacuum in Feet and Inches.

Editor Marine Review:—The good-natured chaff under the above heading in your issue of last week was entertaining, and were it not for some extremely pertinent points, of interest to every vessel owner, thinly veiled by his sarcasm, I would not again encroach on your valuable space. "Engineer" is correct in intimating that I did not see "29" on the vacuum gauge of the Kaiser, owing principally to the fact that the air pumps were not running. But I can tell him what I did see, and what he can also see with but little trouble any time he is in New York: That is, never less than 27½ inches and as high as 29 inches on two Hoboken ferry boats, both equipped in the same manner as the Kaiser, with Blake twin-cylinder air pumps and Wheeler surface condensers. I would suggest that "Engineer" take a vacuum gauge with him, whose honesty he can swear by and test for himself, or, better yet, take two gauges, and he will have the bliss of seeing almost the 60 inches of his dream.

But apart from joking, I said 10 per cent. economy, and I am in dead earnest. How many vessel owners are aware of the fact that oftentimes 20 per cent. of the total steam generated in the boilers of their vessels is expended to drive the auxiliaries alone; and how many of them realize that their direct-acting duplex pumps are consuming from 200 to 300 pounds of steam per horse power per hour? No less an authority than Chas. E. Emery, Ph. D., in Vol. XVII of the "Proceedings of the American Society of Mechanical Engineers," quotes a case where by replacing the extravagant direct-acting duplex pumps with those of better economy he made a saving of 32,000 tons of coal per annum. (Tidewater Oil Co., Bayonne, N. J.) In another case, cited in same paper, the Geo. F. Blake Mfg. Co., contracted with the Standard Oil Co. to replace certain of the so-called "Standard" pumps with their own improved and economical designs. The price was to be the saving of fuel for one year. Before many months had elapsed the clients of the Blake company were glad to cancel this contract and pay the regular price of the pumps, as it was very evident that the guarantee would be largely exceeded.

I would also refer "Engineer" to the published official report of the United States war vessels Minneapolis and Iowa, total horse power main engines 20,000 and 11,824 pounds respectively; total horse power of Blake twin-cylinder air pumps 30 and 17 respectively, or less than one-sixth of one per cent. The official figures of the Kaiser have not been published, but it is honestly believed from private tests that her air pumps horse power will be under one-eighth of one per cent. of her main engine horse power.

Closely following economy of the air pumps comes economy of all the auxiliaries aboard a steamship, especially the pumps, and it would take but a little while to convince even a skeptical engineer that a good 10 per cent. of power of economy is going to waste on a large proportion of our lake vessels. The up-to-date general managers and superintendent engineers of our lake yards and vessel companies are rapidly awakening to this fact, and in recent contracts compound condensers and compound feed pumps are specified. For all I know to the contrary, I am responsible for the first compound condenser and compound feed pump to be adopted on our lake steamers. These are facts, Mr. "Engineer," and are thrust at you for the sake of showing you that you must get off of your green bay mare and onto an Elloree if you want to keep up with the procession. I give you credit for large discernment in discovering that I have pumps to sell, but do not overlook the fact that there are pumps and pumps, and you can be very sure that when you are in the market and come to me you will get not only the best pump on earth, but possibly also an idea or two about the use of your auxiliary exhaust that will help earn that 10 per cent. Selling pumps may not be the same to all men, but it is first, last and all the time the chief end of

Cleveland, March 30, 1898.

W. D. KEARFOTT.

Wing Stanchions—Over-Head Cranes.

Editor Marine Review:—I have read with great pleasure Capt. F. D. Herriman's letter in the Marine Review of the 24th inst. and have noted carefully the sketch accompanying same. I certainly think the proposed addition of wing stanchions is what is required in some of our boats, but it is entirely a question of how the effect of this quarter stanchion could be efficiently obtained. I would refer you to your issue of March 3, 1898, page 8, where you will find midship sections illustrated and numbered Fig. 4 design B, Fig. 6 design D, Fig. 7 design E. I think the belt frame there illustrated would be much more effective than the wing stanchion illustrated by Capt. Herriman, although Capt. Herriman's stanchion is certainly an advance in the right direction. This belt frame, with a solid bilge floor, affords considerable lateral stiffness and is a very positive tie between top and bottom members of the chord. I feel sure that Capt. Herriman's quarter stanchion, if dropped direct to tank top, would be much more effective, and I cannot see that it would affect to any great extent the working of cargo, although, of course, this is a matter of opinion. I know Capt. Herriman was very favorably impressed with this design, and I merely call attention to it as I think, although a little more expensive, it is a much more effective design than that which he proposes, but the additional cost would be so slight that I think it would hardly be worth mentioning. I also think that this construction would have a very beneficial effect on the vibratory action to be noticed on our long ships. It would in any case insure the same period of vibration in both top and bottom members, which I think from optical investigations does not exist in some of our ships at present.

I also notice in the same issue of the Review, under the head "Labor-Saving Machinery in Ship Yards," reference to a traveling gantry recently erected at the Harland & Wolff works, Belfast, and on seeing this design in the British journal, Engineering, the first idea that struck me was how fearfully and wonderfully made! Its huge and cumbersome proportions led me to compare it with over-head traveling cranes designed by the Brown Hoisting & Conveying Machine Co. and those of Messrs. Wellman & Seaver; in fact, it looked to me as though there were too many eggs in one basket, and I think they could take a lesson, with advantage, from the over-head cranes of the Chicago Ship Building Co. and others of the kind.

R. L. NEWMAN,

Asst. Gen'l Manager.

Office of the Globe Iron Works Co.,

Cleveland, March 26, 1898.

Howard Gould's Yacht Niagara.

The steam yacht Niagara, which Howard Gould is said to have offered for the use of New York naval reserves in event of war with Spain, is now nearing completion at the works of the Harlan & Hollingsworth Co., Wilmington, Del. The Niagara is the largest yacht ever built in this country. Following are principal dimensions:

	Feet.	Inches.
Length over all, about.....	272	0
Length between perpendiculars (Lloyd's measurem'ts)	247	6
Breadth, molded.....	36	0
Depth to spar deck at sides.....	27	5
Depth to spar deck at center.....	28	2
Depth, molded, to main deck at center.....	19	6
Depth, molded, to main deck at side.....	19	4

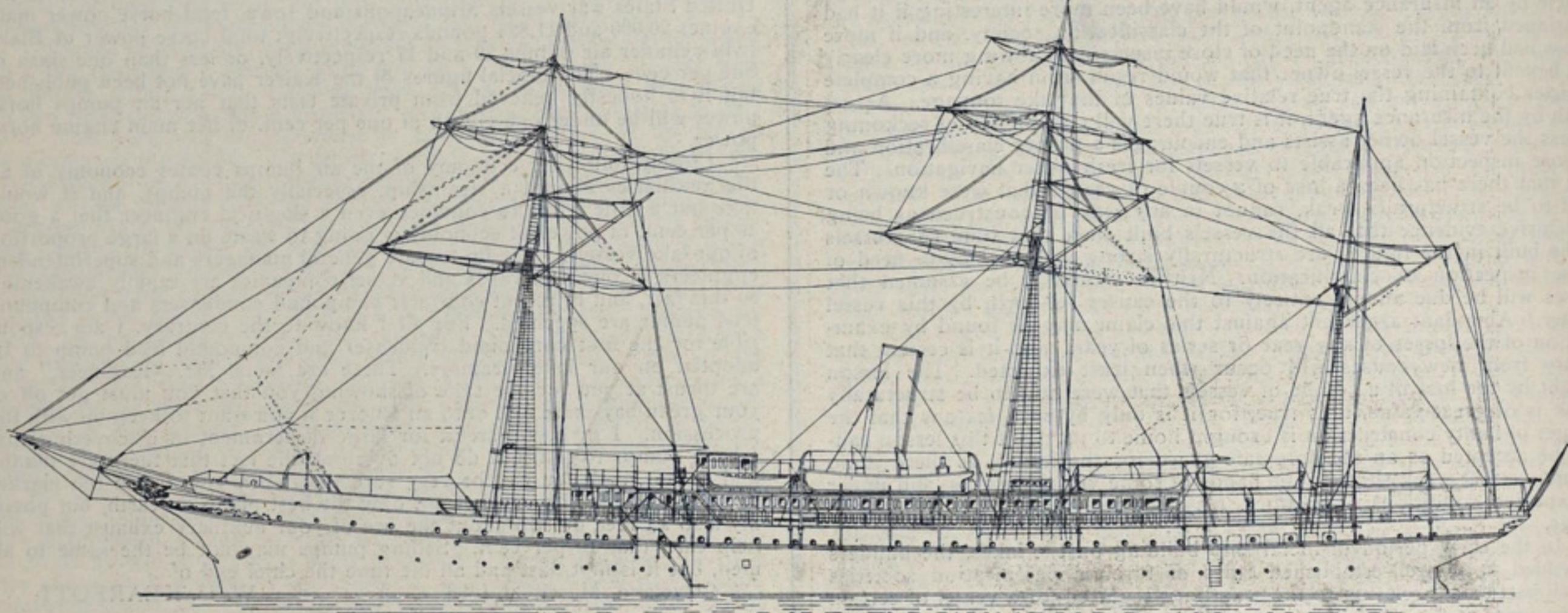
The motive power will be in two surface condensing triple expansion inverted direct-acting engines, each having cylinders of 18, 28 and 45 inches diameter, with 30 inches stroke, and supplied with steam by three steel Scotch boilers, each 13 feet 6 inches by 11 feet 6 inches in the clear. There are three 46-inch furnaces to each boiler and they are proportioned for a working pressure of 160 pounds of steam per square inch; also one donkey boiler of steel, Scotch type, 6 feet 10 inches diameter and 9 feet 2 inches long, with one 40-inch furnace proportioned for 160 pounds steam. The indicated horse power at maximum speed will be about 2,000. The speed designed with 400 tons of coal in bunkers (no water in water bottom but with all other weights on board) is 14 knots on a six-hours' trial, running under natural draught. The full bunker capacity is 425 tons. The rig is to be a bark, square on fore and main mast. The yacht is to be classed under the highest classification at English Lloyds and American United States Standard for twenty-year rating under special survey.

The main deck is of steel throughout and the spar deck partly of steel. Bilge keels of about 140 feet length and 15 inches depth are fitted to the

to the outboard shafting, which is the same as is being used in the most modern ocean liners, the builders of the Niagara using it under a shop right. By this method of construction the usual cast steel hangers, which extend from the after part of the hull in two directions and meet in the boss supporting the outboard shafting close to the propeller wheel, are dispensed with, and in their place the hull is carried out to enclose the shaft within itself. This method of making the shaft supports and covering an integral part of the ship itself adds to the strength of the structure, and there is less obstruction in the water, so that friction is reduced proportionately when the ship is running. Arrangements for handling the yacht have been made on a scale equal to that of an Atlantic liner, as there are steam and hand-steering gears, steam capstan and steam windlass forward, and independent steam capstan aft, together with a special steam winch on the forecastle, and a steam engine with two gypsies amidships for the sole purpose of hoisting the steam launches and small boats. There are to be eleven boats, including two very handsome steam launches.

Teak is used largely about the decks for plankshears, waterways, etc., and also for house and skylight sills. Mahogany is used for the rails, paneling of deck houses, etc. The decks themselves are of the finest selected white pine. The lower deck is of Oregon pine. Deck fittings will be most complete and composed of articles too numerous to mention in a brief description of the vessel. The head and stern carving is exceedingly artistic. The bridge will be a very attractive feature of the ship, being 7 feet wide, framed in teak and fitted with mechanical transmitters, bronze binnacle stand, etc. There will be a complete set of awnings from one end to the other of the ship together with side screens, bridge awning, weather cloths, coaling screens, house covers and all the other details in canvas provided for valuable vessels of this kind. Rigging, blocks, spars and lines were specially designed and are carried out in materials of the best description and neatest workmanship. There will not be found anywhere a finer outfit of sails, spars and wires than will be furnished for the Niagara.

The ship will be steam heated throughout with radiators, coils and



HOWARD GOULD'S YACHT NIAGARA, RECENTLY LAUNCHED AT WILMINGTON, DEL.

yacht to steady her at sea. The fresh water tank supply will be 15,000 gallons independent of fresh water to be carried in the peak tanks. There are six water-tight steel bulkheads, together with fore-and-aft bulkheads in the bunkers. The water-tight thwartship bulkheads are of extra strength and thickness. A water bottom for the entire length of the ship is a feature of additional protection. An auxiliary condenser of 306 square feet cooling surface is intended to take care of exhaust steam from the small machinery, such as electric engines, pumps, etc., when the vessel is at anchor and the main engines are stopped. A combined air and circulating pump is provided, and the water cylinder of the pump will be connected with the water bottom of the vessel for discharging same quickly in case it is necessary to regulate the trim of the ship. Blake pumps in the vessel are all of the latest type. The ash ejector is of See-Stone design.

The electric light plant will consist of two direct connected dynamos and engines installed in duplicate, each set having capacity of 400 16 c. p. lamps. The direct connected four-pole multipolar generators will be driven by a 6 by 5 double enclosed Sturtevant engine, running at a speed of 550 revolutions per minute, under boiler pressure of 100 pounds and will develop 40 horse power. There will also be one polished brass, type D, Rushmore pilot-house projector, 18 inches in diameter, taking 45 amperes, the whole wired and installed complete. The wiring of the ship will be done by the electrical staff of the builders and the whole installation will be finished complete at their yard with their own workmen. The various outlets will be grouped on six circuits, and the insulation and wiring will be done in an up-to-date manner, with all provisions possible for safety and artistic effect. The plant is provided with the usual instruments and spares for operation at sea. A storage battery of forty lights capacity will be installed in a convenient place and wired up complete.

A Remington No. 2 machine for refrigerating purposes will be capable of making 400 pounds of ice per day and cooling 1,500 cubic feet of space to a temperature of 34° F. The refrigerating plant is probably the finest ever fitted to a yacht. In connection with the machinery department there will also be an evaporator and distiller plant of 15 tons capacity, fitted up complete.

The yacht is constructed upon the Lundborg principle of protection

pipes in the usual manner, the whole being trapped and discharged into hot well or filter tank in the engine room. Reducing valves, gauges and other appliances will be fitted as usual. The plumbing system is very complete, consisting of salt and fresh water supply throughout the ship, lifted by steam pumps. The salt water waste is carried overboard. Supply tanks are located on top of the deck house. Drains from all basins and tubs in owner's and guests' quarters are led into a 500-gallon drainage tank in the hold. Drains from all water closets in owner's and guests' quarters are led into sewage tanks, located in the hold, and thence pumped overboard by steam or water syphon blow. Ventilation is carefully looked after in every part of the system.

The Lake Marine News Association, Homer J. Carr, manager, Chicago, will begin its regular newspaper service about Monday next, and is already in position to deal with vessel owners in the matter of special reports at various points around the lakes. This association is gradually building up a complete system of stations around the lakes intended exclusively for vessel reporting service. They recently purchased the station of Mrs. Luella Stimpson at Mackinaw City, and with an increased business at Mackinaw during the coming season, will be prepared to give vessel owners the very best of service at that point. Many of the vessel owners have been greatly interested in Mrs. Stimpson's welfare since her husband was drowned while reporting the passage of vessels, and her retirement from this work will be attended by kind words from those who know of her long and faithful service at Mackinaw. The Lake Marine News Association will also maintain again this season their own stations at Sault Ste. Marie and Detour. These two stations on the Sault river, under one management and carefully handled, have prompted many vessel owners to take down-bound reports from Detour and up-bound reports from the Sault.

Nickel Plate Road. Reduced Rates between Lorain and Painesville to Cleveland.—45 cents one way. Round trip 80 cents. Intermediate points at corresponding rates. These rates effective until otherwise advised. A peerless trio of fast express trains daily. See agents Nickel Plate road.

Appointments of Captains and Engineers.

Dulac, Wm., Mt. Clemens, Mich.: Steamers—Norwalk, Capt. Goodrow, Engineer John Hogan; F. R. Buell, Capt. C. W. Woodgrift, Engineer John Deihl; Canisteo, Capt. Ed. Hendricks, Engineer Reine; A. Weston, Capt. D. McKinzie, Engineer Ed. Cottrell; C. A. Street, Capt. T. J. Carlisle, Engineer Wm. Hogan. Schooners—J. Godfrey, Capt. J. B. Lozen; J. B. Lozen, Capt. Ed. Moore; L. B. Pomeroy, Capt. Wm. Campau; A. Stewart, Capt. John Destrois; Eleanor, Capt. Frank Duboy; Jenette, Capt. Wm. Duboy; Fulton, Capt. Frank Laforgue; Elvina, Capt. Wesley Brown; W. B. Ogden, Capt. Eli Peltier.

Jones, C. R., Cleveland: Steamers—Argo, Capt. Geo. L. Cottrell, Engineer John Golden; Aragon, Capt. W. E. Chateau, Engineer Warren Tilton; Rhoda Emily, Capt. J. Albano, Engineer Ambrose Smith; Preston, Capt. W. J. Harlow, Engineer M. McNamara; Desmond, Capt. L. F. Hunt, Engineer Geo. Hendry; Argonaut, Capt. J. H. Warwick, Engineer —; M. C. Neff, Capt. C. M. Ennes, Engineer J. Carr. Schooners—Chas. Wall, Capt. A. Carter; John O'Neil, Capt. A. Gustafson; Delos De Wolf, Capt. —; Hattie, Capt. Joe Mason; Canton, Capt. H. Jeffery; J. T. Mott, Capt. Harry May; John Magee, Capt. M. Anderson.

Hall, Geo., Coal Co., Ogdensburg, N. Y.: Steamer—Hecla, Capt. D. Hourigan, Engineer D. Doyle. Tugs—Proctor, Capt. W. A. Russell, Engineer A. E. Cline; Wilson, Capt. Joseph Richard, Engineer Jas. Conliff; Curlew, Capt. P. J. McGrath, Engineer Geo. M. Cline. Schooners—W. A. Sherman, Capt. C. W. Howard; Bolivia, Capt. Jas. Gooden; Jennie

Maddock, Engineer J. C. Bennett; H. S. Pickands, Capt. J. B. Maddock, Engineer F. Schneller. Schooner—D. K. Clint, Capt. Burt Peltier. Crosby Transportation Co., Muskegon, Mich.: Steamers—Nyack, Capt. Chas. A. Lyman, Engineer Carl Hallberg; Wisconsin, Capt. Thos. Honner, Engineer Alexander Currie.

Fries, Valentine, Shinrock, O.: Steamer—Wm. Edwards, Capt. John M. Johnston, Engineer —. Schooners—Golden Age, Capt. Daniel H. Stalker; Charles Foster, Capt. John F. Higgin; M. W. Page, Capt. Charles Hubbard.

Currie, Thomas, Port Huron, Mich.: Steamer—City of New York, Capt. Thomas Currie, Engineer James Dillon. Schooners—Wm. Groudy, Capt. Robert Smith; A. C. Keating, Capt. Phil. Tousley.

United States & Ontario Steamship Nav. Co., A. C. Huidekoper, Mgr., Conneaut, O.: Steamers—Shenango No. 1, Capt. R. R. McLeod, Engineer Geo. Collinge; Shenango No. 2, Capt. Geo. L. Thompson, Engineer Wm. Elliott.

Ralph, P. J. & Co., Detroit: Steamer—S. J. Macy, Capt. M. W. Gotham, Engineer W. F. Gregory. Schooner—Mabel Wilson, Capt. J. E. Gotham.

Kelley, John, Saginaw, E. S., Mich.: Steamer—S. C. Baldwin, Capt. J. A. Madigan, Engineer Joseph Hall. Schooners—A. A. Carpenter, Capt. Walter Fullum; Marian Butman, Capt. John Bell.

Burdick, Leander, Toledo, O.: Steamer—Panther, Capt. A. W. Stalker, Engineer Magnus E. Schladtsch. Schooner—Massasoit, Capt. J. G. Cook.



BRADDOCK POINT LIGHT STATION, LAKE ONTARIO.

Mathews, Capt. F. D. Linn; Beals, Capt. Geo. Cote; Mary Lyon, Capt. S. LaFlam. Barges—Diamond, Capt. Alex. Robideau; Mohawk, Capt. Laurat Vernier; Onondaga, Capt. Isidore Brunett; Argosy, Capt. John Gauthier.

Sicken, M., Marine City, Mich.: Steamers—M. Sicken, Capt. John Kuhn, Engineer Wm. Sicken; S. K. Martin, Capt. Edw. Mattison, Engineer M. Britz; Geo. King, Capt. Wm. Burns, Engineer M. Owen. Schooners—St. Joseph, Capt. A. Marsreau; Teutonia, Capt. Harry Lawrence; Thos. Gawn, Capt. Julius Lawrence; E. J. McVea, Capt. Joseph Chartrou; Melvina, Capt. Harry Larsen; C. Spademan, Capt. Geo. Gullett; Grace Whitney, Capt. John Lorenzen; Levi Rawson, Capt. James Kobel.

Lake Michigan & Lake Superior Trans. Co., Chicago: Steamers—Manitou, Capt. Allan McIntyre, Engineer R. L. Peck; Peerless, Capt. H. C. Page, Engineer J. R. Bennett; City of Traverse, Capt. J. M. Twitchell, Engineer Ed. Meeh; Jay Gould, Capt. Jos. White, Engineer D. H. Robertson; Jas. Fisk, Jr., Capt. Donald MacLean, Engineer Henry Chalk.

Sullivan, L. S., Toledo, O.: Steamer—D. W. Rust, Capt. Wm. J. Seaver, Engineer L. De May. Schooners—C. C. Barnes, Capt. Geo. W. Burtis; Chicago Board of Trade, Capt. Geo. Bennet; John Schuette, Capt. Oscar H. Brown; H. H. Badger, Capt. Jas. Robinson; Maumee Valley, Capt. H. Scanlon.

Ann Arbor Railroad & Steamship Lines, Toledo, O.: Steamers—Ann Arbor No. 1, Capt. Peter Kilty, Engineer Albert Ackerman; Ann Arbor No. 2, Capt. W. P. Robertson, Engineer T. H. Cosgrove. Capt. W. P. Robertson is also in charge of the company's vessel property on shore during the winter.

Huron Transportation Co., Milwaukee: Steamers—F. & P. M. No. 1, Capt. A. F. Pittman, Engineer E. P. Pike, Clerk L. C. Butler; City of Fremont, Capt. M. F. Morgan, Engineer Charles Grobden, Clerk James G. Allen.

Teagan Bros., Detroit: Steamers—Chauncy Hurlbut, Capt. J. C.

Curtis Navigation Co., L. P. Graves, Mgr., Buffalo: Steamer—C. F. Curtis, Capt. James Cunningham, Engineer Wm. J. Cunningham. Schooners—Isabel Reed, Capt. Peter Johnson; Holland, Capt. Peter Kischgens; Fassett, Capt. Peter Kischgens.

Port Huron & Washburn Line of Steamers, T. R. Wright, Mgr., Port Huron, Mich.: Steamers—Colorado, Capt. John McLean, Engineer Thos. F. Birch; Osceola, Capt. John McLeod, Engineer Jos. Oag.

Northern Michigan Transportation Co., Chicago: Steamers—Petoskey, Capt. Peter McGuigan, Engineer Thomas Collins; City of Charlevoix, Capt. Wm. Finucan, Engineer James W. Myers.

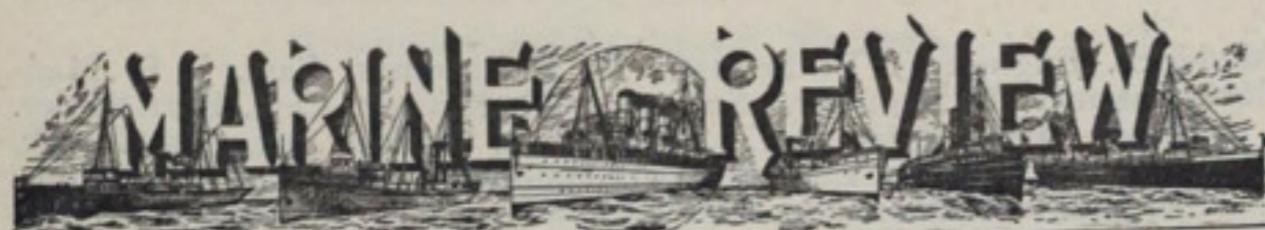
Kelderhouse, John, Buffalo: Steamer—Thos. Mayham, Capt. C. H. Cummings, Engineer R. J. Close.

Charlevoix Lumber Co., Charlevoix, Mich.: Steamer—Pine Lake, Capt. E. S. Small, Engineer John Chemock.

Daily service, excepting Sunday, between Detroit and Cleveland, is now provided by the D. & C. line steamers City of Detroit and City of Cleveland, and the Cleveland & Buffalo Transit Co. announces that the City of Buffalo will leave Cleveland for Buffalo on Saturday, April 2. The second steamer of the Cleveland & Buffalo line, State of Ohio, will be placed in service about May 1, and will continue on the route until the new side-wheel steamer City of Erie goes into commission some time in June. The steamer State of New York will make her first trip to Toledo from Cleveland April 2.

Charts of Georgian bay will be required by most of the captains of vessels of the medium class during the coming season, on account of the increasing traffic in that direction. The Marine Review has in stock at all times the best charts of Georgian bay that are made.

Subscribers who wish to have the Marine Review delivered to them through the marine postoffice, Detroit, will please notify us at once.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio.
by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1897, contained the names of 3,230 vessels, of 1,410,102.60 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1897, was 399, and their aggregate gross tonnage 769,366.68; the number of vessels of this class owned in all other parts of the country on the same date was 314, and their tonnage 685,709.07, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1897, was as follows:

	Gross Number.	Tonnage.
Steam vessels	1,775	97,235.45
Sailing vessels and barges.....	1,094	394,888.87
Canal boats	361	37,978.28
Total	3,230	1,410,102.60

The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
" " " 1897.....	120	116,936.98
Total	611	403,327.91

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1897	1896	1895	1897	1896	1895
Number of vessel passages						
Tonnage, net registered.....	17,171	18,615	17,956	2,986	3,406	3,434
Days of navigation.....	17,619,933	17,249,418	16,806,781	365	365	365

President McKinley has nominated Civil Engineer Mordecai T. Endicott, U. S. N., to be chief of the bureau of yards and docks of the navy department in succession to Rear Admiral E. O. Matthews, whose term of office has expired. The nomination of a civilian member of the staff to the position of chief of the bureau of yards and docks is a new departure. Hitherto the headship of this important department has been invariably confided to a senior line officer. It is understood, however, that Secretary Long, having in view the important work to be undertaken under this department during his administration, including the construction of four new dry docks, was anxious to have a skilled technical officer as chief of the bureau. Mr. Endicott is one of the most experienced authorities in the matter of dry docks in the country, and has served, during his career as a naval civil engineer, in all the principal government dock yards. Last year he was selected by Secretary Long as one of the members of the armor factory board to prepare plans and estimates for the establishment of a government armor plate manufacturing plant. He was also selected by President Cleveland in 1895 as the naval member of the Nicaragua canal commission.—Army and Navy Journal.

A bill that is intended to settle considerable friction now existing in the appointment of local and assistant inspectors of steam vessels has passed the senate and is now before the house. It is known as senate bill 3,218 and provides for the following amendment to section 4415 of the revised statutes: "The designation, nomination and appointment of local and assistant inspectors referred to in this and the preceding section of this title shall be made solely with reference to their fitness, it being further provided that the local and assistant inspectors referred to in this section shall not be removed from office except for incompetency, inefficiency, misconduct or physical or mental disability, and for those causes only after charges duly proved before a committee of three supervising inspectors to be appointed by the supervising inspector-general, under the direction of the secretary of the treasury; it being further provided that the supervising inspector of the district wherein the accused officer resides shall not be eligible to serve on such committee."

A quarterly dividend of 1½ per cent., payable April 15, has probably had considerable to do with recent advances in the value of shares of the Minnesota Iron Co. It is stated that the company did not originally intend to begin paying dividends until July, but the year 1897 was a profitable one and justified such action at an early date. The large expenses for improvements for lake steamers for several years past have all been made out of earnings, and there was no reason why stockholders should not begin to receive a part of the surplus earnings. There is little doubt that business this year will be larger than last, as far as sales of ore are concerned, and the profit per ton will also be larger. There is no apparent reason why 6 per cent. dividends cannot be maintained, as the company is fully equipped in every department to do a larger business than at any time in the past.

Chicago gets \$400,000 for river improvement in the sundry civil appropriation bill, now before the senate, and is just that much better off than any other city on the lakes, as in all other cases the government makes appropriations for outer harbor work only, the local interests providing for river dredging. But the scheme of having the general government provide river improvement in Chicago on a scale involving the

expenditure of several millions for a channel of 18 or 20 feet depth has failed, at least for the present. It was thought that as there will be no river and harbor bill in the present congress, the senate might be induced to include, as an amendment to the sundry civil bill, a clause providing for a survey of the big Chicago project, but this the senate will not do, on the ground that the project is new and has no place in the regular appropriation bill.

A leading editorial in the last issue of the Marine Journal, New York, takes exception to credit being given to President Geo. Uhler, or the Marine Engineers' Beneficial Association, for the repeal, some time ago, of regulations pertaining to government fees from licensed officers of vessels and from sailors generally for support of the Marine hospital service. The Journal goes into records of this action in Washington and warms up to the subject in a way that would indicate decided opposition to some of the claims made by Mr. Uhler. It would seem that the engineers should be seeking the helpful influence rather than the opposition of a publication like the Marine Journal.

A story of mishap to a river steamer, more amusing than the experience of two or three lake captains who are said to have mistaken lighted gas wells for harbor lights, comes from Paducah, Ky. "The steamer Joe Fowler has just arrived here from Evansville," says the dispatch, "with her bow stove in and otherwise badly injured. Near Tolu Landing, fifty miles above, a farmer who was signaling her with a lantern remained back in the woods, and in the darkness she crashed head on into the bank. There was great consternation among the passengers. It has not been determined who was to blame for the accident."

A naval appropriation bill providing for three battleships, six torpedo boats, six torpedo boat destroyers, a gunboat and four dry docks is meeting with opposition in congress, notwithstanding the Cuban difficulties, and yet Japan will build, according to 1898 programme, three battleships, five first-class cruisers, six second-class cruisers, three torpedo vessels, eight destroyers and twelve torpedo boats; England proposes to spend \$127,750,000; Russia will spend for ships alone \$83,333,400; Germany will spend \$95,000,000, and France will build one battleship, eight cruisers, eight destroyers and six torpedo boats.

Rear Admiral Makaroff of the Russian navy, who recently made a second trip to this country for the purpose of examining ice-crushing steamers on the lakes, spent two days with Capt. Boynton aboard the car ferry steamers St. Marie and St. Ignace in the Straits of Mackinac. He is carrying out plans for keeping the harbor of St. Petersburg open to navigation throughout the year by means of ice crushers, the first of which, a vessel of 8,000 tons displacement and 3,000 horse power, is now being built in England.

Among bills that have passed the United States senate and will soon be considered by the house is one giving consent to the erection of a bridge across Portage lake, Michigan, between the villages of Houghton and Hancock, and another authorizing the secretary of the navy to remit to the Union Iron Works of San Francisco the horse power penalty imposed under the contract for the armored coast-defense vessel Monterey, and appropriating \$32,823 for that purpose.

The United States senate will have printed for the use of senators 3,000 copies of the report of the hearing before the senate committee on commerce on March 3, in relation to the bill (S. 624) to establish the department of commerce and industries.

Capital of the John P. Holland Torpedo Boat Co. of New York has been increased from \$600,000 to \$1,000,000.

Mr. Carnegie's Ship Yard Idea.

Among ship builders whose opinion upon Mr. Carnegie's recent letter was sought by the Iron Trade Review was Henry W. Cramp, vice-president of the Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia. The letter asking Mr. Cramp's views contained the following statement and question: "In spite of the lower prices of steel in this country and the reported higher efficiency of machinery in ship yards here than abroad, Americans who buy ships insist that the foreign vessels are the cheapest. Is this because our cheaper steel and more efficient machinery have not yet overcome the difference in wages between the United States and European countries?" Mr. Cramp's reply is as follows:

"With regard to the letter of Mr. Andrew Carnegie, relative to the establishment of a ship yard at New York, and the comments made on it by various papers and ship builders, to which you call my attention, I remark that from my point of view the question raised by Mr. Carnegie does not seem at this time to demand discussion. So far as I can see the real need of the American ship building industry is not additional ship yards, but additional ships to build. Until this latter requirement shall have been fulfilled or is in a fair way of fulfillment, the discussion of the question of sites or locations of new ship yards will be at least premature. Your concluding question is based upon the assumption that 'foreign built vessels are the cheapest.' Having assumed this, you ask, 'Is this because the cheaper steel and the more efficient machinery have not yet overcome the difference in wages between the United States and European countries?' In this you have asked only half and perhaps not the most important half of the real question. The difference in wages as between this country and England is about 100 to 60 in the average against this country, in all branches of ship building labor. But more important than this is the fact that the English not only have the benefit of cheaper labor, but they use it to build cheap ships; that is to say, inferior ships, class for class. This, you will perceive, operates doubly to the disadvantage of American builders in competition with the English. The observations that I have offered with regard to English builders will apply with about equal force to German, and to some, though not really so great an extent, to French builders."

Prominent Engineers Discuss Marine oilers.

Darwin Almy, Charles Ward and W. M. McFarland are names that have been prominently connected in this country with current engineering literature on the subject of water tube boilers, and readers of the Review will therefore be interested in a short summary of a discussion that took place between these gentlemen at a recent meeting of the American Society of Naval Engineers in Washington. Messrs. Almy and Ward are manufacturers of water tube boilers, and Mr. McFarland is one of the bright young engineers of the navy. At the Washington meeting two papers on water tube boilers were presented, one by Mr. Almy and the other by Mr. Jay M. Whitman. The latter paper contained summaries of trials of the Niclausse water tube boiler, and was valuable mainly for information furnished regarding that particular boiler, but Mr. Almy's paper dealt with the subject generally and admitted of discussion. Mr. Almy said:

"As water tube boilers are being more extensively used in marine vessels of all descriptions, they are destined in the near future to take the place of all fire tube boilers. This may seem to many to be a very broad assertion; nevertheless, I believe it to be true. When we look back and see the many different designs of water tube boilers that were built before 1880 (and, so far as I am able to learn, every one of them was a failure), and then look at the great stride that has been made in the building of them and the success that they have attained in the past ten years, who can tell what the next five years will bring forth? In speaking of the early water tube boiler I refer to both land or stationary and marine boilers, but the boiler that I refer to since 1880 is entirely for marine use. There were illustrated in various publications prior to 1880 the designs of water tube boilers that embodied every principle that is found in those that are in use at the present time. They were built with straight tubes, bent tubes and coils. The tubes were placed at various angles from horizontal to perpendicular. Some of them had their downflow tubes inside, others outside of the jacket, and some without downflow tubes. They were also furnished with various forms of separators. In looking over these designs and analyzing them, it is very easy to see why they failed. One of their greatest defects was the lack of provision for the expansion of the tubes forming the heating surface. In those where they provided for the expansion they were lacking in heating surface. Other marked defects were in the circulation and inability to furnish dry steam, or else so dry that it was extremely superheated. They also used tubes of too large diameter. (These defects are characteristic of some of the water tube boilers that are being placed in vessels even at this time, and which will in a short time demonstrate this fact.)

"In order to make a successful water tube boiler, it must have a provision for expansion in every direction and a perfect circulation. When I say perfect circulation I mean that there must not be some other way that the water can go to escape from the extreme heat of the furnace; if there is such a course, the water is sure to take it rather than to go the way which is intended. The circuits must be short and direct, so that there will be no steam pocket formed in the tube in contact with the furnace heat. The flow of gases should be equal over the whole heating surface, whether the boiler is being worked at a low or high duty. It should give dry steam—not over one or two per cent. moisture. It should not give superheated steam, as that burns out the packing around piston and valve rods, cuts the valve seats and cylinders, necessitating the use of oil to prevent cutting. Oil thus introduced coats the condenser tube and the heating surface of the boiler, affecting its evaporation, shortening its life, and causing greater loss than is gained by the extra duty performed by superheating the steam. The heating surface must be thick enough to insure durability and to prevent rupture if the metal should become overheated by careless usage. The boiler must be easily accessible for repairs and so designed that a defective part of the heating surface can be removed or stopped off without removing any of the jacket or being obliged to cut out some other tube in order to renew a defective tube. It must carry an even water level—not over 2 to 3 inches change of level from working full power to stop, and there should be no more change when the vessel is rolling.

"A water tube boiler that will fill such conditions will take the place of the fire tube and will have the advantage of occupying much less space, one-third to one-quarter the weight, greater economy, safety and durability. In the present water tube boiler there is nothing new in principle, but the improvements have been in the form, material and details of construction, and the many patents that are issued are on that particular form and description given in the patent specifications. It is often said that some water tube boilers have too many joints, especially screw joints, that come in contact with the furnace heat. This is a mistaken idea, which has been proved by many years of continual usage. It does not make any difference whether it is a screwed or an expanded joint. So long as the boiler has a perfect circulation of water through all the tubes and the expansion is provided for in every direction, the joint is no more liable to leak than the tube itself. If it is lacking in these two factors, even if it is a solid drawn tube, the boiler is doomed to failure.

"The diameter of the tube is another factor which plays a very important part in the construction and the life of a boiler. Large tubes that come in contact with the furnace heat can never be successful, for the reason that the expansion cannot be overcome. The smallest tube that can be used has not been determined; that will depend on the length of the circuit. From my observation, I am satisfied that the tubes which form the fire box should not, under any conditions, exceed 12 feet in length or 2 inches external diameter. If so, the boiler is of short life, unless it is worked at a low duty. There is another factor which has a great deal to do with the success of water tube boilers; that is, the size of furnace and length of the fire bars. If they are to compete with the Scotch boiler, they must have the furnace to conform more nearly to its conditions. In the Scotch boiler the furnace rarely exceeds 21 square feet of grate surface and 5½ to 6 feet length of fire bars, yet water tube boilers are built with 60 or more square feet of grate surface in one furnace, and the fire bars 7 to 9 feet in length. With such fires to manipulate, how can one expect to get the efficiency out of the water tube boiler that he does out of the Scotch boiler?

"The statement is often made that water tube boilers contain a very small quantity of water. This is more of an advantage than disadvantage,

for this reason: steam can be raised to 100 pounds pressure from cold water in five to twenty minutes without injury, whereas in the Scotch boiler it takes from three to six hours. This means a saving of so much coal and time, which in daily service would be from 10 to 20 per cent. for the coal, to say nothing of the time saved. The small quantity of water means a saving in weight and an increase of safety. The only advantage that a large quantity of water has, if it can be called an advantage, is that it does not require so close attention to the feed. In the water tube boiler the same end is attained by the use of an automatic feed water regulator."

"I have already expressed the opinion that water tube boilers have come to stay," said Mr. McFarland in discussing the foregoing paper, "and my belief is that in time it will entirely displace the cylindrical boiler on board ship. Before it can do so, however, one point must be looked after by the manufacturers of water tube boilers, namely, the economy at fairly high rates of combustion. While there are a number of water tube boilers which do give good results at high rates of combustion, there are others in which the uptake temperature is altogether too high. A recent case of two of our vessels, the *Wheeling* and the *Marietta* illustrates this point. The *Wheeling* has cylindrical boilers, with the Howden system of forced draft, while the *Marietta* has Babcock & Wilcox water tube boilers. On their trial trips they developed about the same horse power; and, as the engines are absolutely identical, if the boilers had been of the same economy, the cost of a horse power should have been the same. On the contrary, with the water tube boiler a horse power cost nearly half a pound of coal more than with the cylindrical boiler fitted with Howden draft. The uptake temperatures were taken in the two cases, and with the cylindrical boilers the temperature was about 550 degrees, while with the Babcock & Wilcox boilers it was from 850 to 1,100 degrees, a difference of from 300 to 550 degrees, which easily accounts for the difference in economy. I do not look on this as a difficulty in the principle of the water tube boiler, but merely as a point in design which can be remedied if care is taken; but I feel that water tube boiler makers are standing in the way of the rapid introduction of the type so long as they do not take care to prevent these high uptake temperatures with consequent loss of fuel."

Answering this criticism from Mr. McFarland, Mr. Charles Ward said: "Manufacturers of water tube boilers are aware that the matter of high temperatures in uptakes is an objection frequently urged; but let us look at the facts in this particular case. In the *Wheeling*, fitted with Scotch boilers, we not only have the Scotch boilers, but have in addition a device known as Howden's forced draft. The arrangement, as you all know, is a large box which takes the place of the ordinary breeching, fitted with numerous tubes. The gases of combustion pass through this box in contact with the tubes on their way to the uptake. The air furnished by the blowers to the fires passes through the tubes for the express purpose of recovering the waste heat from the gases from the Scotch boilers before they enter the uptakes, in much the same manner and for the same purpose as feed water heaters are fitted. It is obvious if the temperature of the gases were not high there would be little gained from the use of Howden forced draft. Its very presence implies a large waste in the uptakes of the boilers to which it is attached. I have no doubt, if Mr. Howden were present, he would tell with much satisfaction how great the temperature of the gases is on entering his appliance and how much he recovers, which would be lost but for the intervention of his economizer. This being the case, it is easy to see that the comparison is not a fair one and that the low temperature in this case, at least, is not any advantage the Scotch boiler has over its new competitor, but is due to secondary means. High temperature in the uptake is a bugbear wherever present, and ought to be deprecated. It often exists when there is no necessity, as the result of improper firing. Long use of the Scotch boiler has made attendants familiar with methods which in care-taking and firing produce the best results, and the best effort of the ablest engineering talent of the world has been many years in bringing the Scotch boiler up to whatever usefulness and efficiency it possesses today. When the water tube boiler has passed through the same process of evolution we shall have something immeasurably better. The methods which applied to the old do not apply to the new, and our engineers and operators must cast off prejudices and study the best methods of care and treatment necessary to the new conditions. When the engineering fraternity has had as much experience with water tube boilers as with the old type the result will be eminently satisfactory. High stack temperature is usually an evidence of improper firing. A well-designed water tube boiler has usually a large fire box or combustion chamber. Sometimes this is lined with fire-brick. If the fire is too thick or too heavy, perfect combustion cannot take place; what should be a combustion chamber becomes a gas retort, and dry distillation takes place. The gases resulting fill the passages through the boiler and the uptake; presently a clear place breaks through the fire, and sufficient heat and air as a result ignites the whole; the gases still evolving from the heavy fire continue to burn in the upper parts instead of in the combustion chamber. The fires should be of such thickness and fed at such intervals as would secure the gases being generated and consumed in the same ratio. When this is done the highest economy, efficiency and cool uptakes result. What we need is a corps of trained firemen who would second the efforts of the engineer, as a trained nurse does the doctor. An indifferent one can neutralize the economy of the finest expansion engine. While the ship is running the fireman disposes of more value than perhaps any other man aboard, and the saving resulting from good, intelligent firing as compared with the worst is anywhere from 15 to 30 per cent."

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28, April 7.

If occasion required it, British private ship yards could lay down in short order thirty battleships and fifty cruisers. Ten years ago England had but 139 fighting ships in commission, with 24,800 men, while today she has 238 such ships with 50,300 men.

Around the Lakes.

Arrangements are being made for opening a temporary naval recruiting station in the government building, Cleveland.

After the 1st of January next Canadian hull inspectors will not be permitted to engage in any other business or to hold any civil office.

Martin Connors has arranged with vessel men and elevator managers in Cleveland to handle grain at \$2.50 per 1,000 bushels.

Morgan Baldwin, who was for sixteen years harbor-master at Toronto, died at his home in that city a few days ago. He was sixty-three years of age.

The death of Capt. Joseph B. Hall, member of the firm of Magill & Hall of Chicago, was announced on Sunday last. Capt. Hall was born in Ashtabula, O., in 1822, and for nearly fifty years followed the lakes.

Capt. G. B. Davis, who has followed the lakes for over twenty years, is about to undertake an Alaskan trip, under a contract with the Klondike Promotion Co., Dexter building, Chicago. He will sail the steamer Fortune Hunter, which is being built in Chicago for Yukon river service, and which will be shipped, about April 1, to St. Michaels by way of San Francisco.

James Barnet of No. 535 Sixtieth street, Englewood, Chicago, who was connected with the publication forty years ago of the first Coast Pilot for the lakes, and who has since made two or three trips to Scotland, has been inspired to pay a poetic tribute to the Tay, Scotland's most beautiful river. The verses have been set to music and are offered for sale in Chicago as well as in Scotland.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, March 26, 1898:

	Wheat, bushels.	Corn, bushels.
Chicago	6,650,000	17,147,000
Duluth	3,293,000	3,196,000
Milwaukee	109,000	104,000
Detroit	100,000	23,000
Toledo	244,000	1,065,000
Buffalo	585,000	686,000
	10,981,000	22,221,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 928,000 bushels of wheat and an increase of 295,000 bushels of corn. On the same date there was afloat at Chicago 1,693,000 bushels of wheat, 8,254,000 bushels of corn, 232,000 bushels of oats, 389,000 bushels of rye and 33,000 bushels of barley; at Buffalo 334,000 bushels of wheat; and at Milwaukee 1,509,000 bushels of corn and 316,000 bushels of oats.

Big Foundry and Machine Shop.

The General Electric Co. has just placed contracts for the construction, at its Schenectady works, of a new foundry that will be one of the largest in this country. The work of this company, even with forces operating overtime, has grown beyond the capacity of foundries at Lynn and Schenectady, and all is now to be concentrated in the new foundry. The building will be of brick, 500 feet long and 140 feet wide with an L 100 feet by 120 feet. The latter will be used as a cleaning shop. Besides these main buildings a number of sand sheds, several smaller buildings for the storage of foundry material, and a new pattern store house 200 feet long, 60 feet wide and two stories high, will also be erected. All combined, the floor space occupied will be about 12,000 square feet.

Plans are also under consideration for a new machine shop, 650 feet long by 165 feet wide, but the appropriation for this has not yet been authorized. These buildings will be erected on the property which the General Electric Co. recently purchased from the Gilbert Car Works. It lies to the west of the present works and parallel with the Erie canal. The contemplated machine shop will be devoted almost entirely to large machine work. It will have a total floor space of not less than 144,250 square feet. The size of the great generators which the General Electric Co. has been manufacturing has of late been increasing until a generator of 4,000 horse power is not now regarded as of unusual size. In fact, generators of 5,000 horse power are now in course of design, and the demand upon the shop in which the large machinery has heretofore been built has far outgrown its present proportions. The middle aisle of the new machine shop will be 65 feet wide, with narrower aisles down each side. Electric traveling cranes will be installed to operate along each aisle, and a gallery will be built along one side only. All the large machine tools will be removed from their present locations to the new shop, their places being taken by smaller apparatus.

Chicago's Favorite Passenger Station.

Reasonable success seems to have followed the efforts of the management of the Nickel Plate road to make the line popular as a passenger line for travel east and west. It is regarded as a favorite by many in making the journey to or from Chicago.

Great satisfaction will be felt by patrons of that line to learn that arrangements are made, effective Sunday, March 6, for all passenger trains of the Nickel Plate road to arrive at and depart from the Van Buren street station in Chicago.

With the many advantages afforded by this great union depot, located in the heart of the business portion of Chicago, and the continued advantage offered by lower rates than over other lines, with three express trains daily, with through sleeping cars to New York and Boston, and the advantage of superb meals served in the dining cars and eating houses operated by the road, when all considered, should show increased travel over the Nickel Plate road.

16, April 7.

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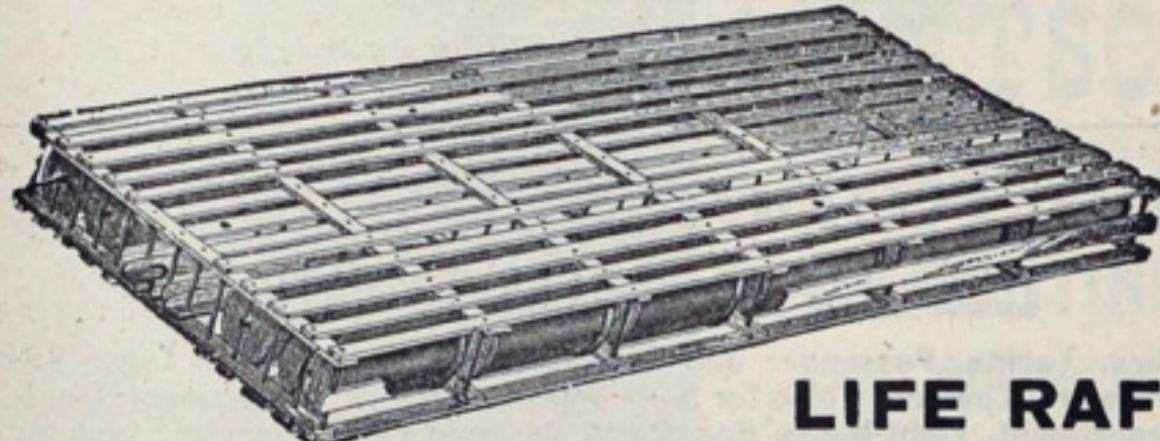
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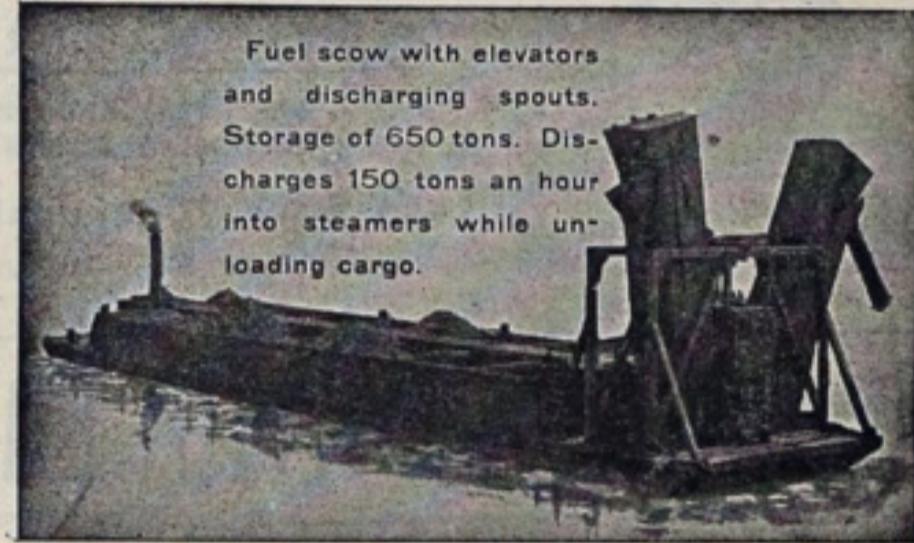
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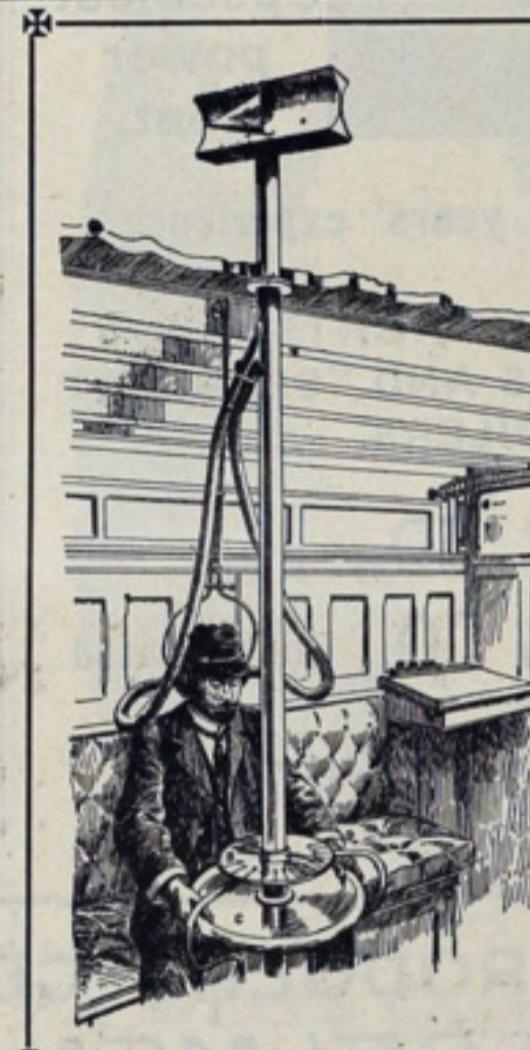
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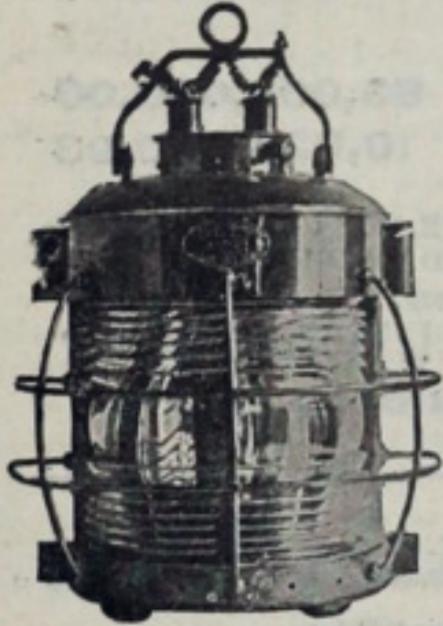
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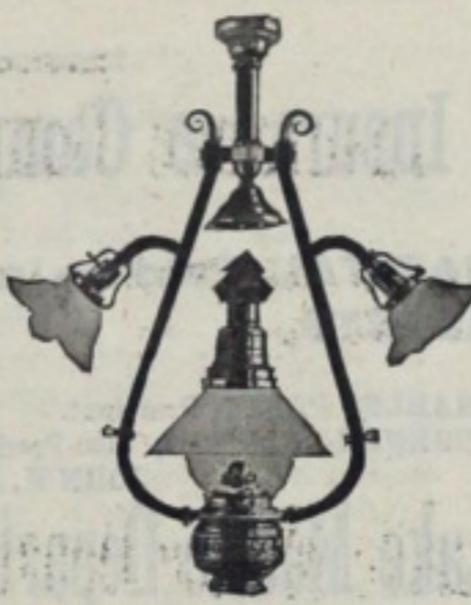
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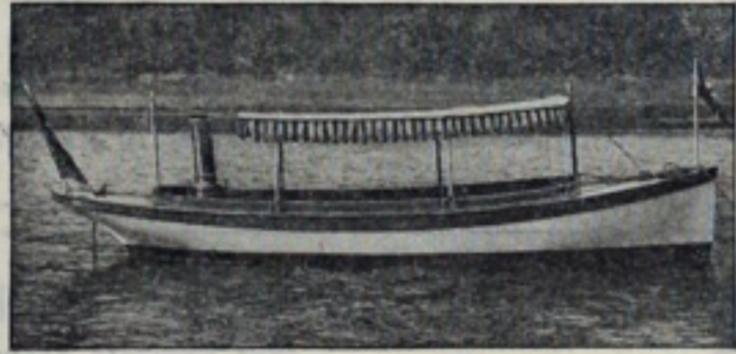
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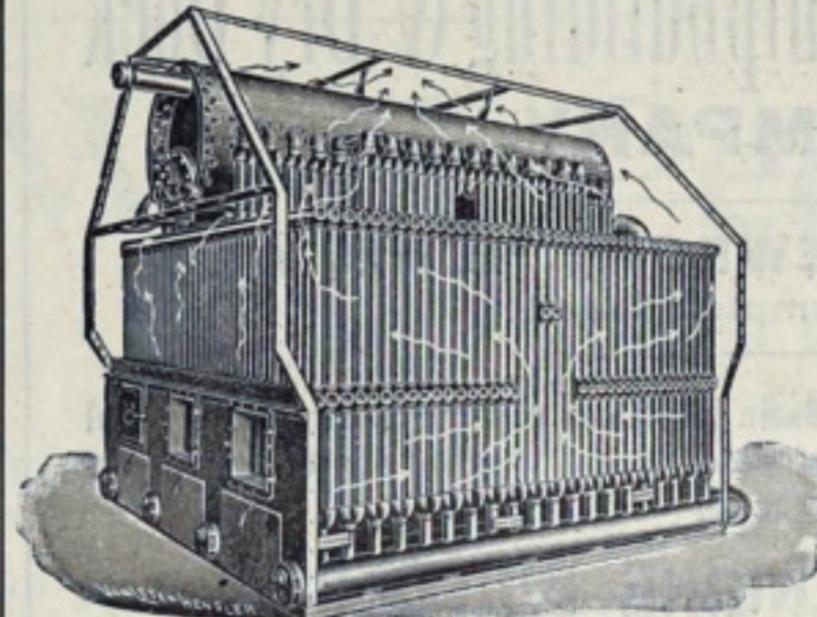
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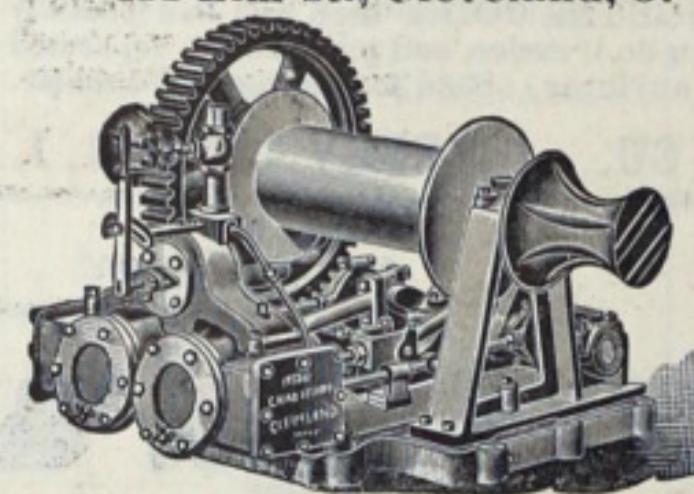
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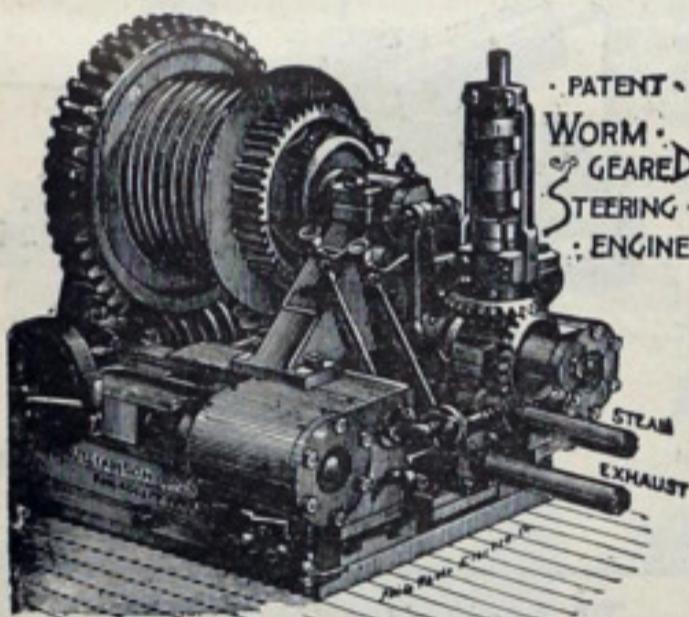
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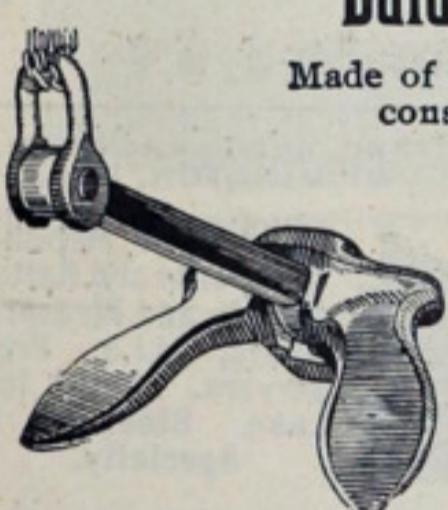
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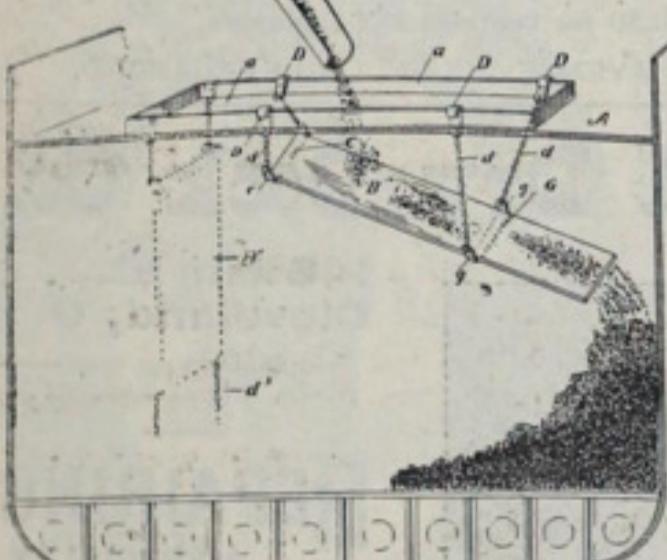
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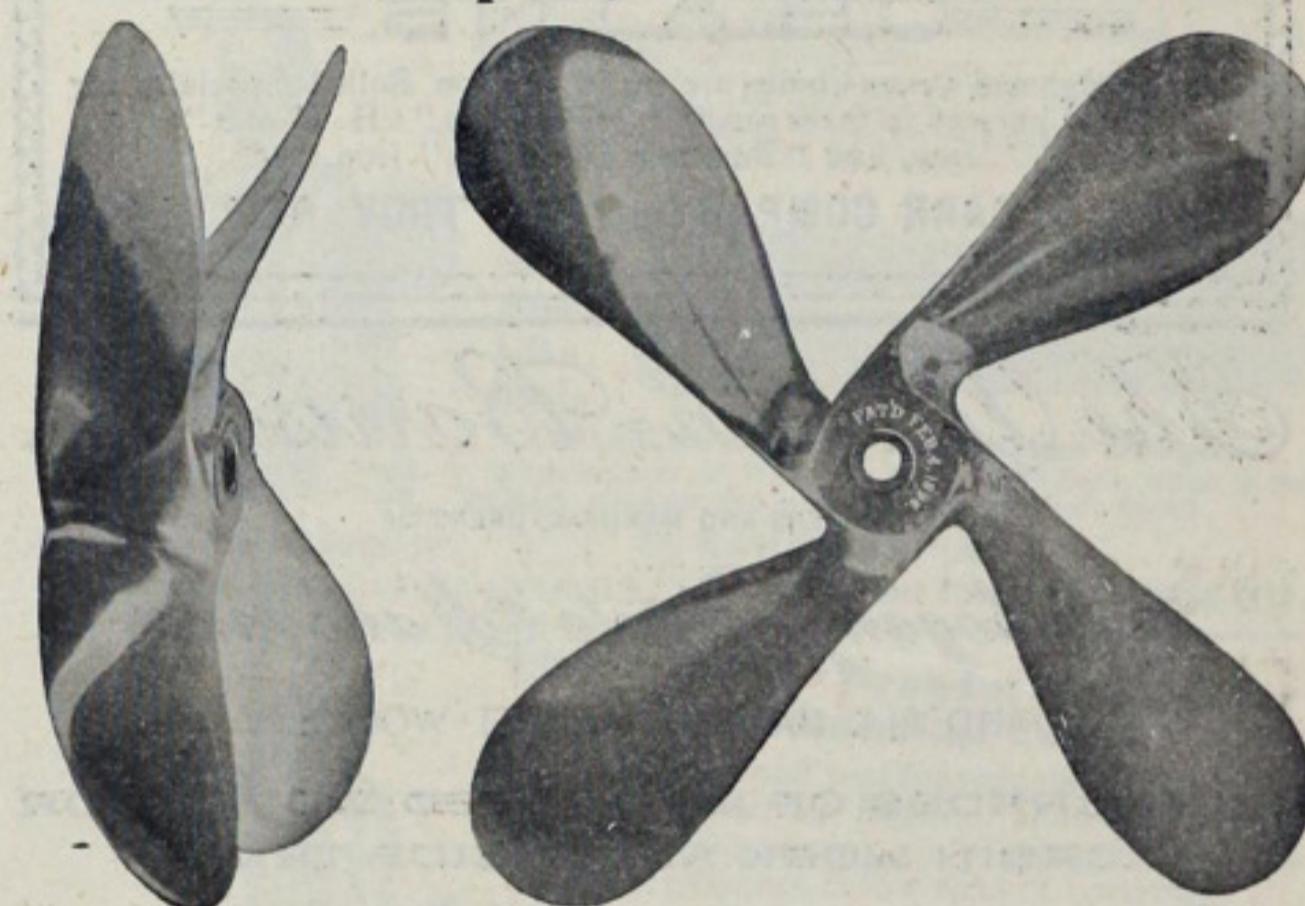
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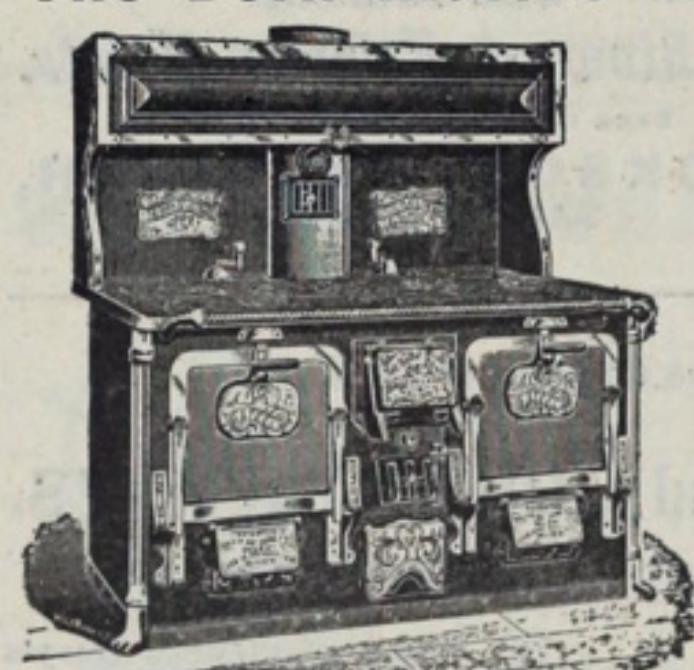


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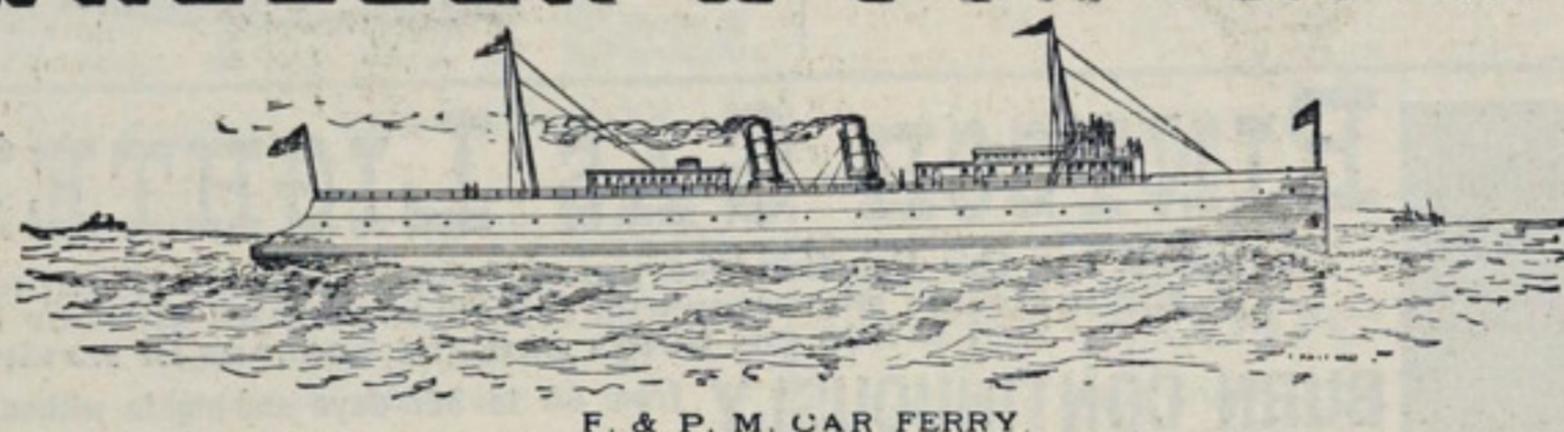
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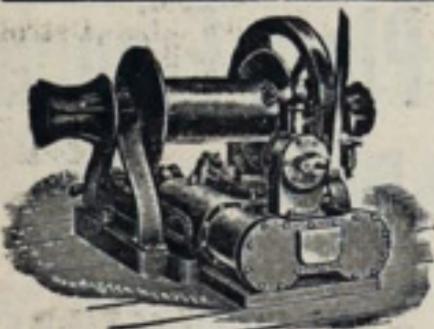
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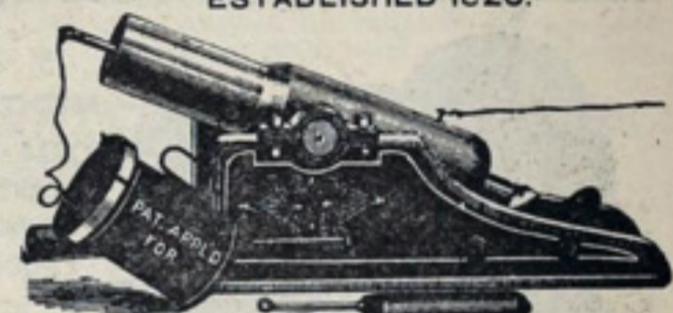
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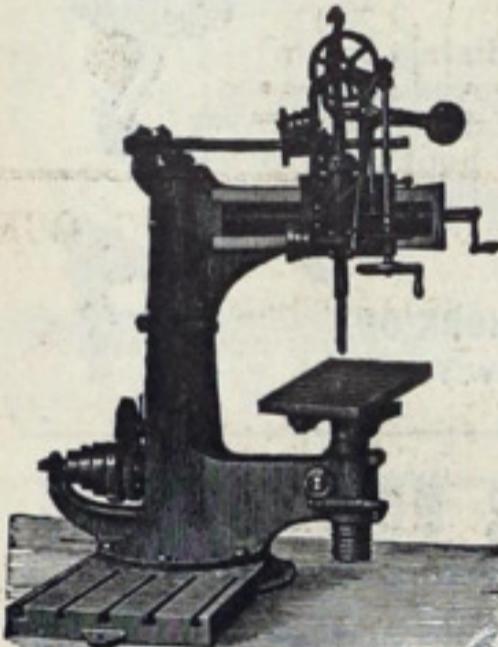
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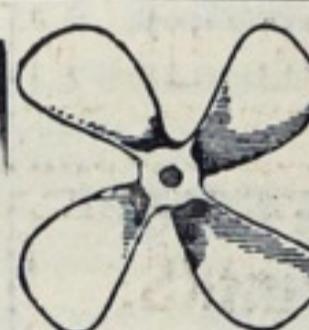
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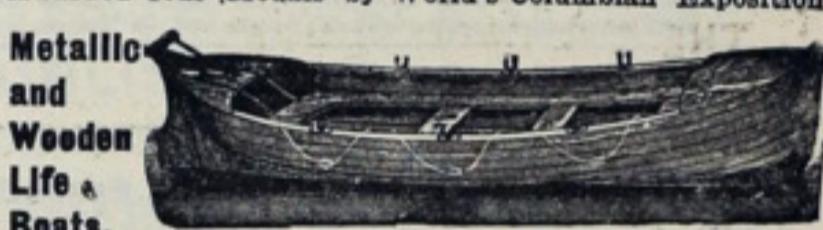
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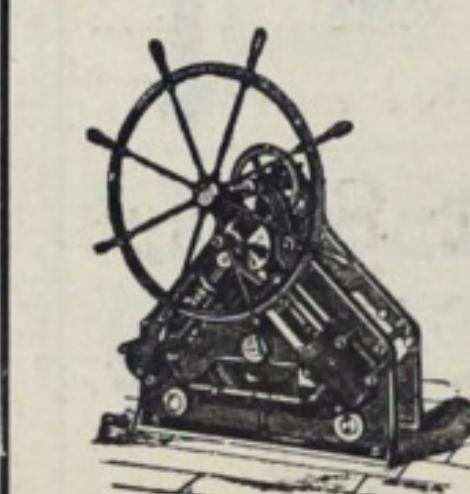
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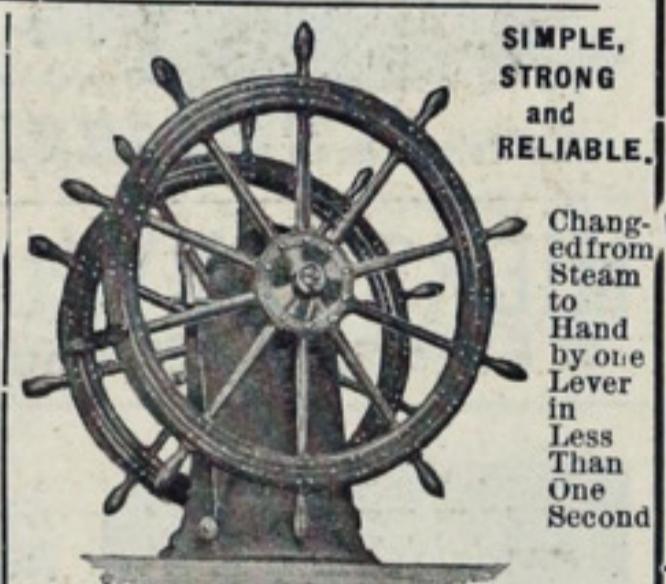
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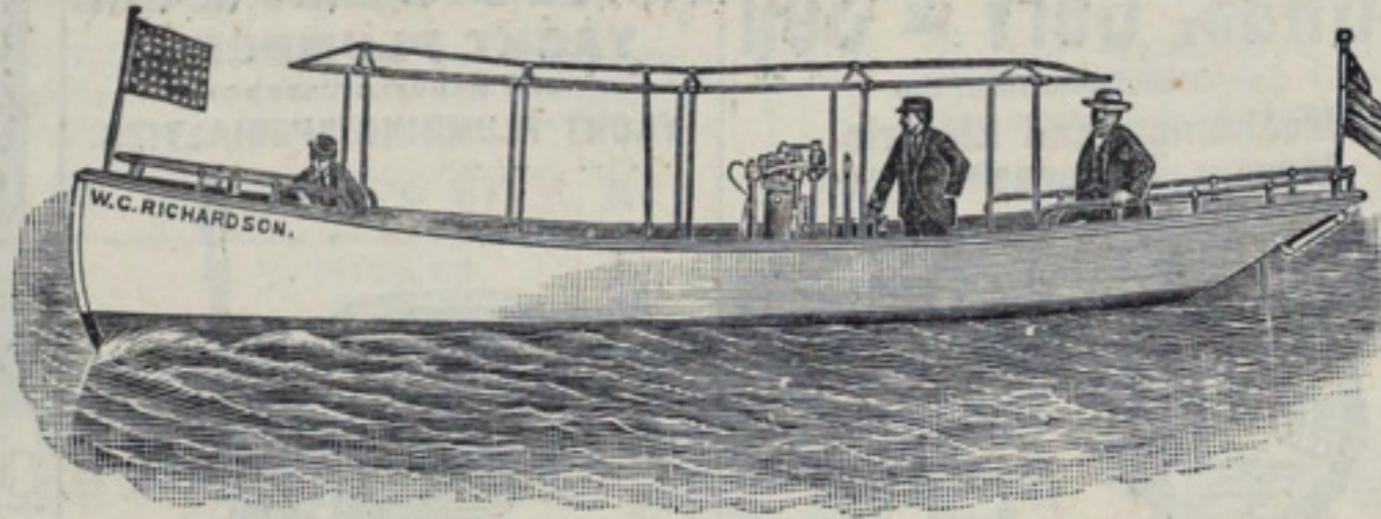


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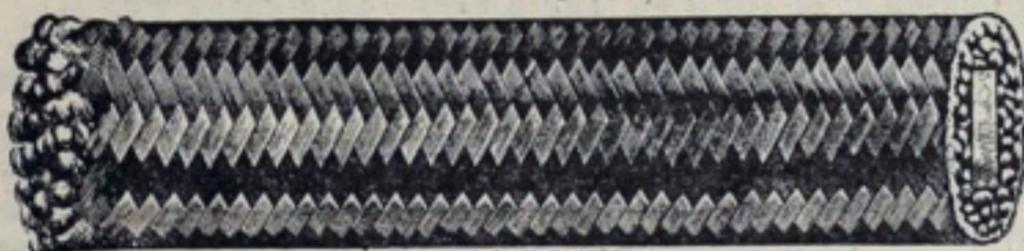
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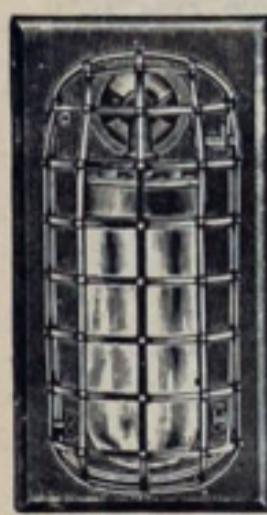
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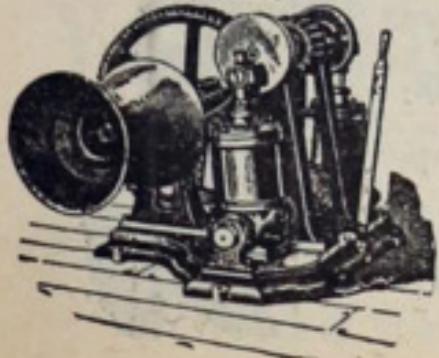
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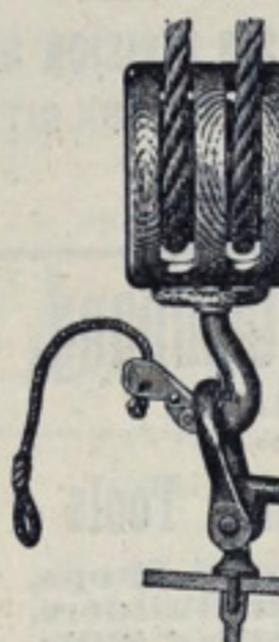
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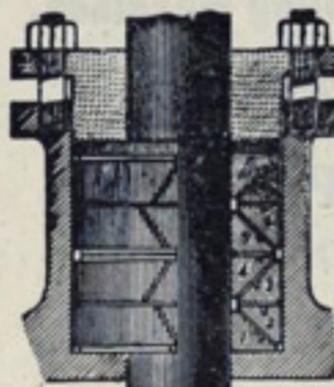


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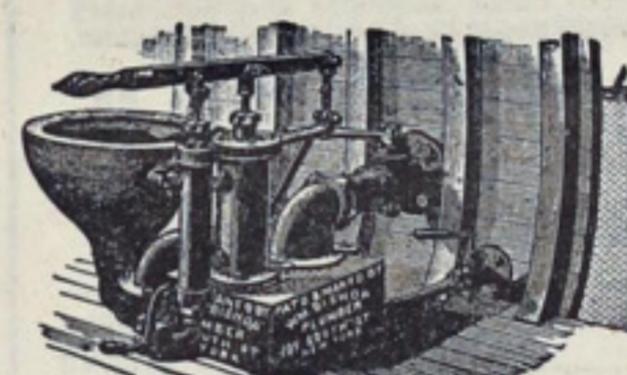
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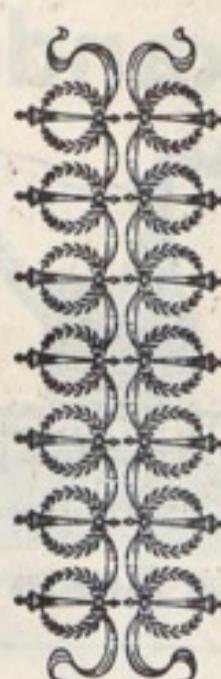
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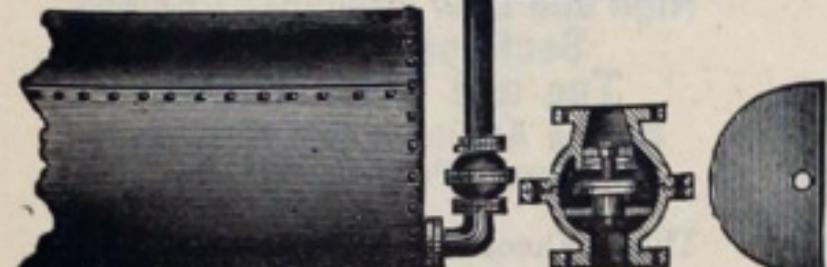
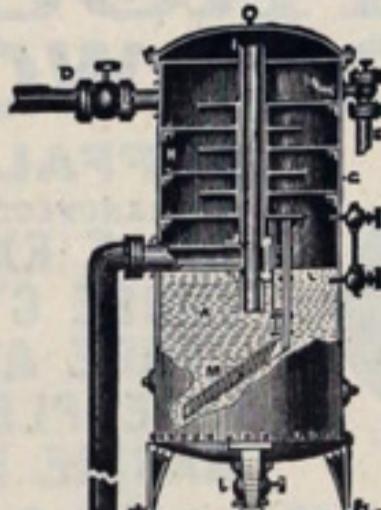
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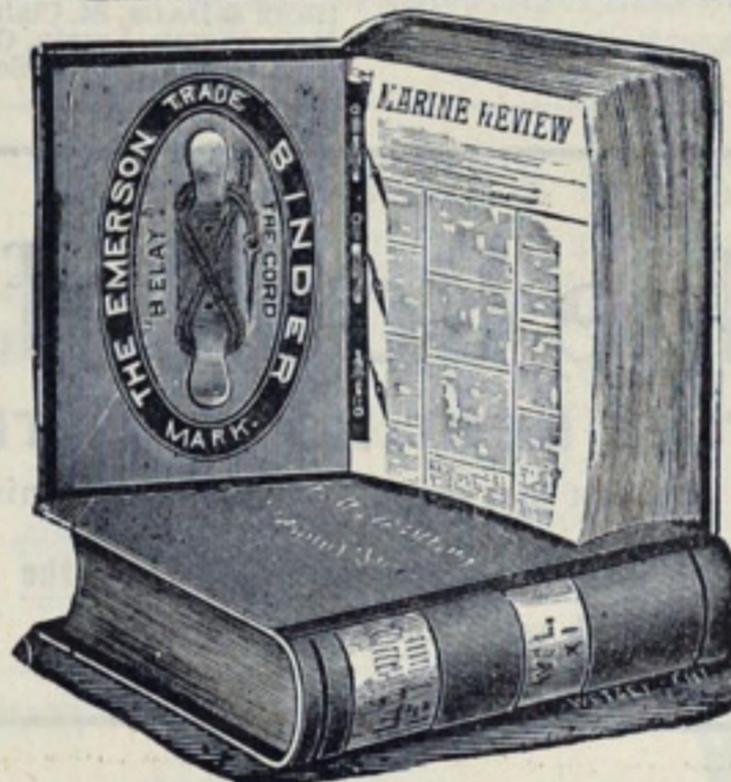
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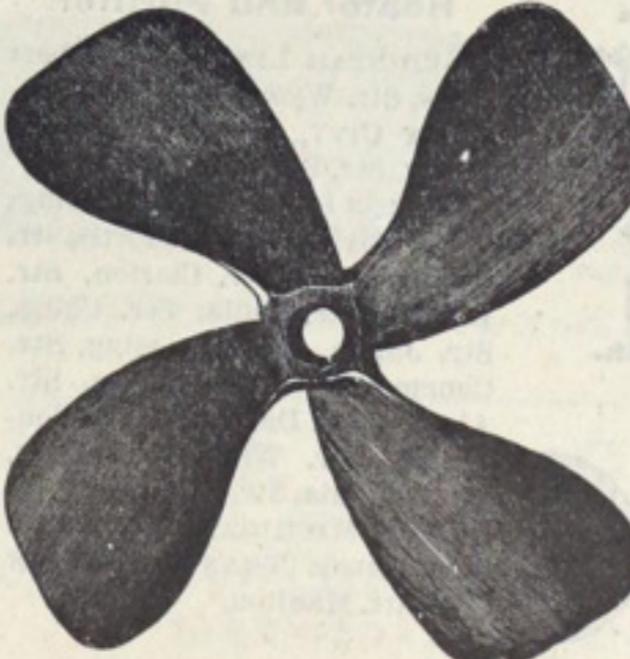
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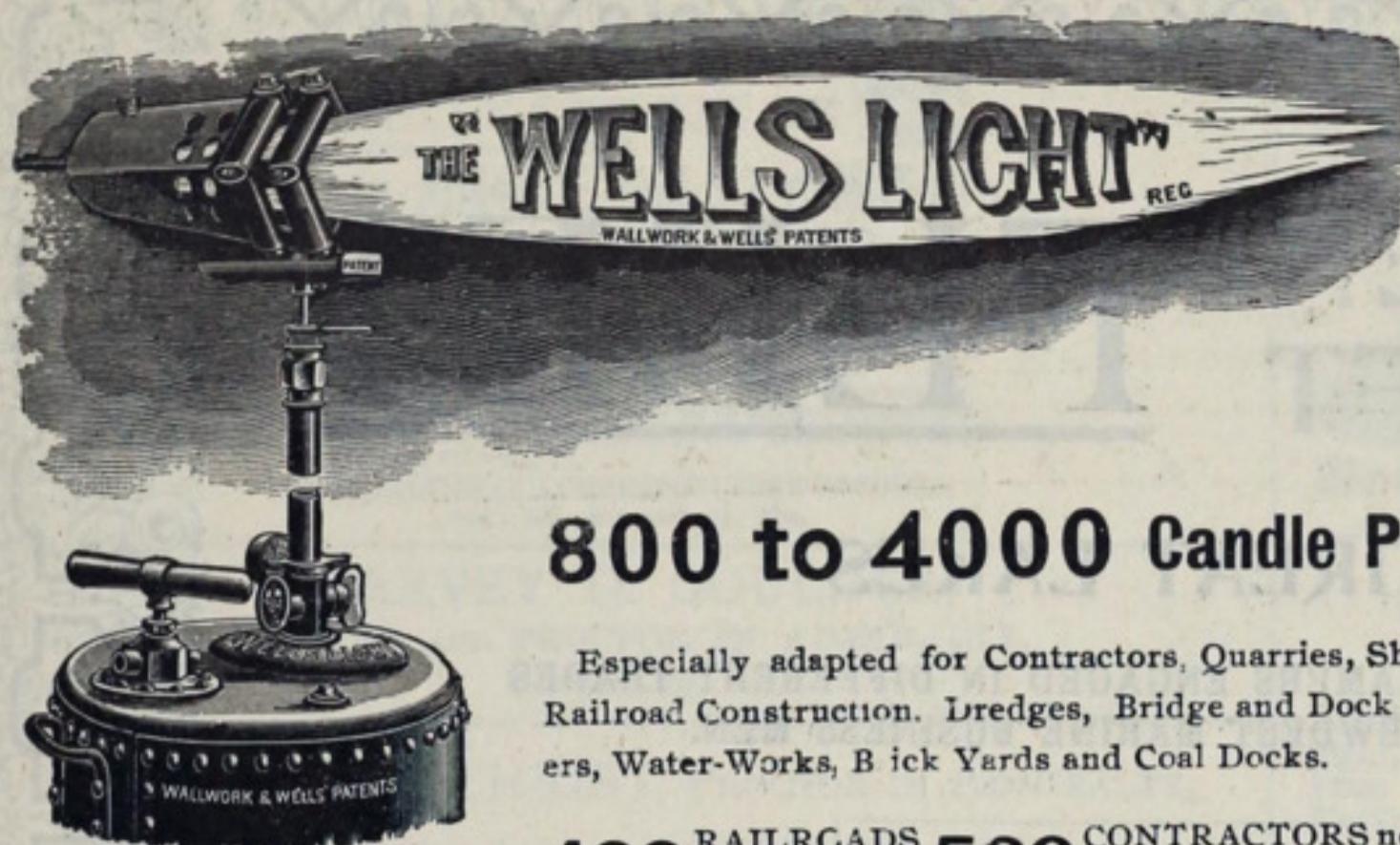
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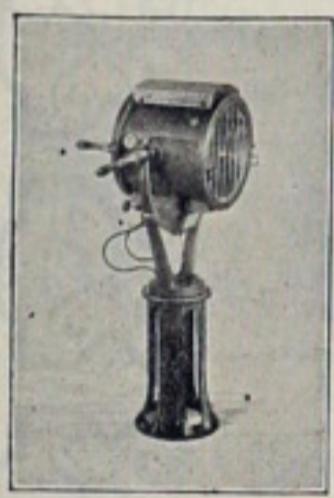
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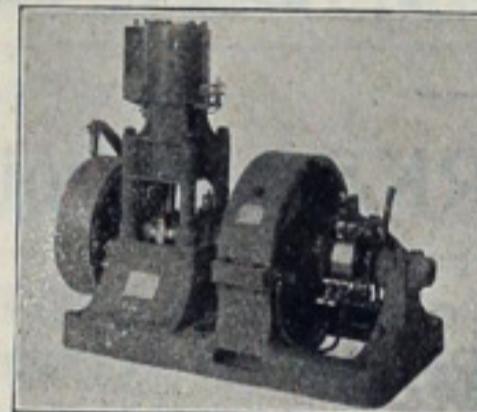
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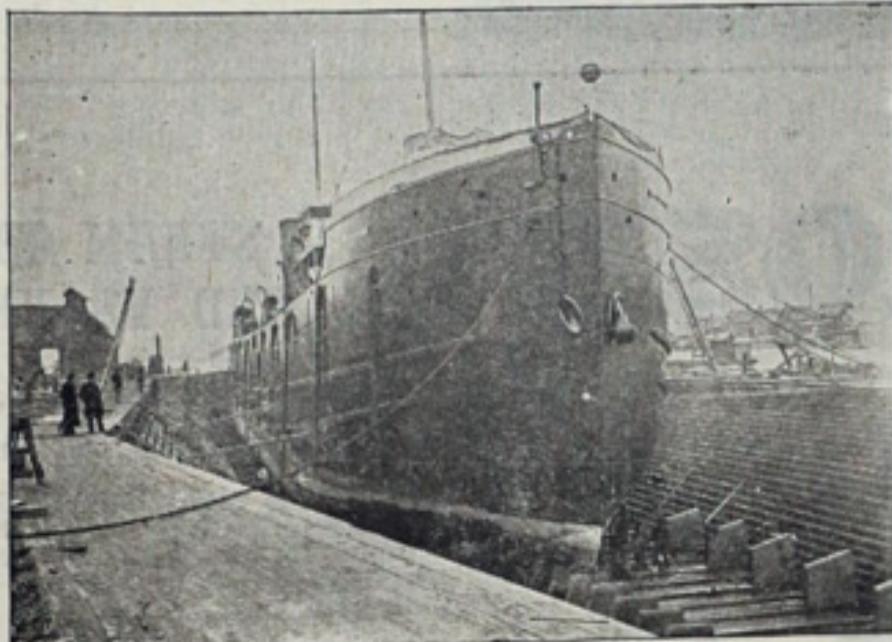
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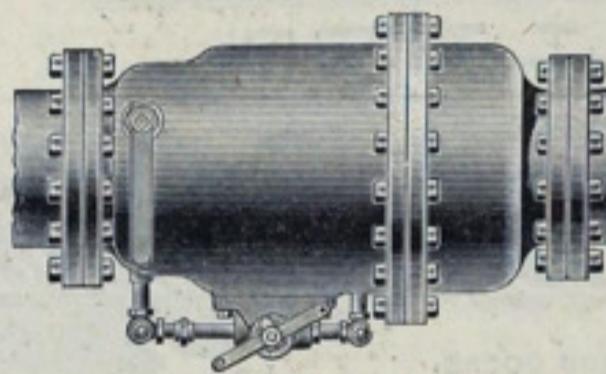
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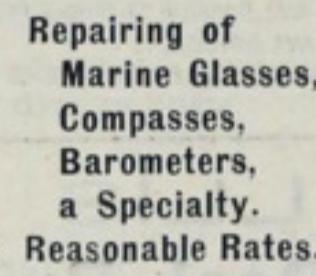
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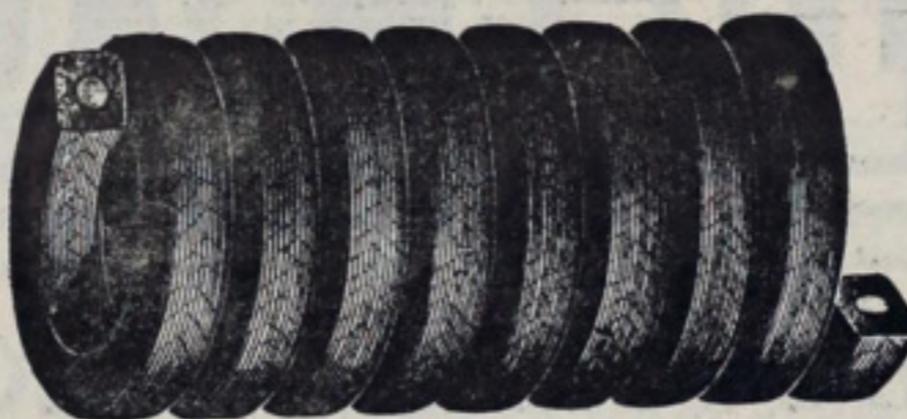
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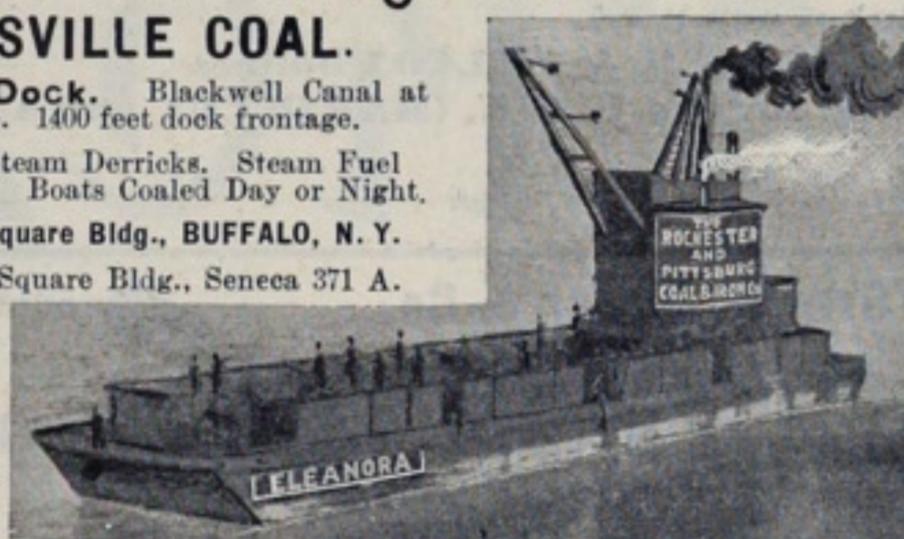
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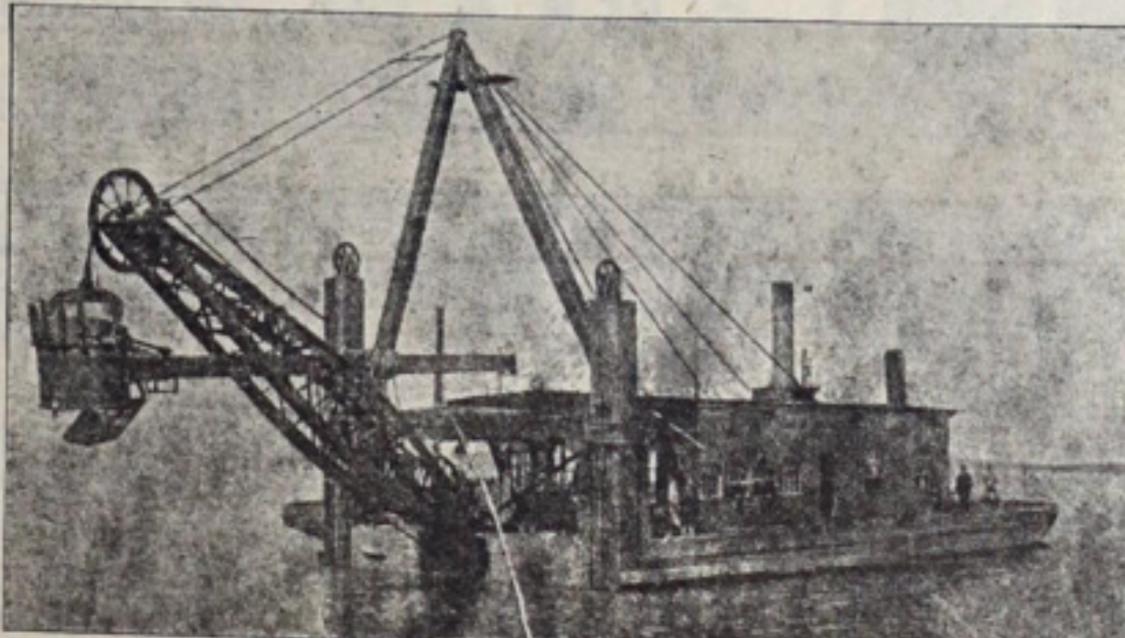
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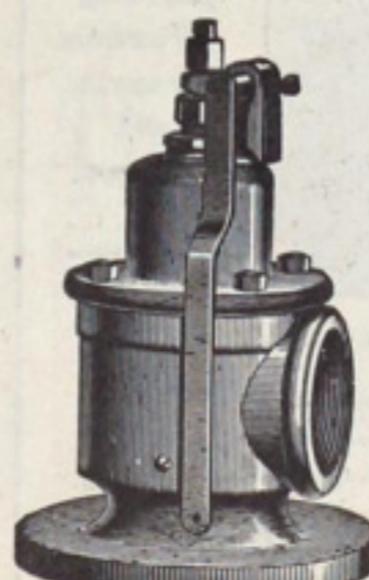


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